

Project No. 1251-100
Crude Oil Tank Farms Project, Agrood Area 30 (Module-1)



| | |
|---------------------------|---|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

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|-----|--|---------------------|
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Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

1-Mechanical Completion Certificate (MCC)

SYSTEM MECHANICAL COMPLETION CERTIFICATE (MCC)

PROJECT TITLE : CRUDE OIL TANK FARM(AGROOD AREA

PROJECT No : 1251-100

SYSTEM NAME : Tank-03 Cathodic Protection System

SYSTEM ID : 030-CP-004

THIS IS TO CERTIFY THAT:

- THE ABOVE SYSTEM HAS BEEN FABRICATED, ERECTED, INSTALLED AND TESTED TO THE REQUIREMENTS OF THE CONTRACT DRAWINGS, SPECIFICATIONS, THE APPLICABLE CODES AND STANDARDS.
- ALL PRE-COMMISSIONING RELEVANT ACTIVITIES, TESTS, INSPECTIONS AND CHECKS HAVE BEEN CARRIED OUT FOR THIS SYSTEM AND FOUND ACCEPTABLE.
- Q/C DOCUMENTATION OF THE ABOVE SYSTEM HAS BEEN AUDITED BY THE CUSTOMER SITE QUALITY CONTROL AND FOUND COMPLETED.
- ALL PUNCH LIST ITEMS CATEGORY (A) IN THIS SUBSYSTEM WERE CLEARED.
- THIS SYTEM IS MECHANICALLY COMPLETED ON THE DATE AND READY FOR COMMISSIONING (RFC) WITH THE FOLLOWING EXCEPTIONS.

EXCEPTIONS :

NOTE: ACCEPTANCE OF THE ABOVE SYSTEM DOES NOT RELIEVE ENPPI/CONSTRUCTION CONTRACTOR FROM THEIR CONTRACTUAL OBLIGATIONS AND RESPONSIBILITIES.

| COMPANY | PETROJET | ENPPI | PPC |
|-----------|------------------|-------|-----|
| NAME | Sady Selem | | |
| TITLE | EFTI Qc engineer | | |
| SIGNATURE | | | |
| DATE | | | |



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

2- Ready for Startup Certificate (RFSU)

READY FOR START UP CERTIFICATE

PROJECT TITLE : EGPC CRUDE OIL TANK FARMS PROJECT (AGROOD-02)

PROJECT No. : 1251-100

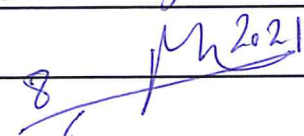

SYSTEM /AREA /PLANT : Tank-03 Cathodic Protection System

SYSTEM /AREA /PLANT No. : 030-CP-004

THIS IS TO CERTIFY THAT:

- THE MENTIONED SYSTEM /AREA /PLANT IS READY FOR START UP WHERE ALL MECHANICAL WORKS, PRECOMMISSIONING AND COMMISSIONING ACTIVITIES HAVE BEEN SUCCESSFULLY COMPLETED.
- MECHANICAL COMPLETION CERTIFICATE(S) FOR THE MENTIONED SYSTEM / AREA / PLANT HAVE BEEN SIGNED.
- ISSUANCE OF THIS READY FOR START UP CERTIFICATE(S) SHALL NOT RELIEVE CONTRACTOR(S) FROM THEIR OBLIGATIONS TO COMPLETE THE REMAINING SYSTEMS NOR FROM THEIR WARRANTY OBLIGATIONS AND OTHER PROVISIONS OF THE CONTRACT.
- THE FOLLOWING EXCEPTIONS AGREED TO BE CLEARED AFTER START UP AND WILL NOT PREVENT START UP ACTIVITIES.

EXCEPTIONS :

| COMPANY | CONSORTIUM | PPC |
|-----------|---|---|
| NAME | Mostafa Ibrahim | |
| TITLE | ELI engineer | |
| SIGNATURE |  |  |
| DATE | 8/1/2021 | |



READY FOR START UP CERTIFICATE

PROJECT TITLE : EGPC CRUDE OIL TANK FARMS PROJECT (AGROOD-03)

PROJECT No. : 1251-100

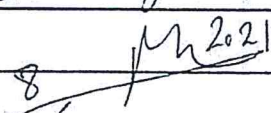
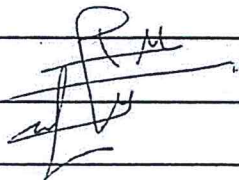
SYSTEM /AREA /PLANT : Tank-03 Cathodic Protection System

SYSTEM /AREA /PLANT No. : 030-CP-004

THIS IS TO CERTIFY THAT:

- THE MENTIONED SYSTEM /AREA /PLANT IS READY FOR START UP WHERE ALL MECHANICAL WORKS, PRECOMMISSIONING AND COMMISSIONING ACTIVITIES HAVE BEEN SUCCESSFULLY COMPLETED.
- MECHANICAL COMPLETION CERTIFICATE(S) FOR THE MENTIONED SYSTEM / AREA / PLANT HAVE BEEN SIGNED.
- ISSUANCE OF THIS READY FOR START UP CERTIFICATE(S) SHALL NOT RELIEVE CONTRACTOR(S) FROM THEIR OBLIGATIONS TO COMPLETE THE REMAINING SYSTEMS NOR FROM THEIR WARRANTY OBLIGATIONS AND OTHER PROVISIONS OF THE CONTRACT.
- THE FOLLOWING EXCEPTIONS AGREED TO BE CLEARED AFTER START UP AND WILL NOT PREVENT START UP ACTIVITIES.

EXCEPTIONS:

| COMPANY | CONSORTIUM | PPC |
|-----------|---|---|
| NAME | Mostafa ibrahim | |
| TITLE | E/I engineer | |
| SIGNATURE |  |  |
| DATE | 8/1/2021 | |



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

3- System Punch Lists

**Enppi****PUNCH LIST****PROJECT TITLE :** CRUDE OIL TANK FARM PROJECT (AGROOD AREA)**PROJECT NUMBER :** 01251-100**DISCIPLINE:** Cathodic Protection**SYSTEM NAME:** Tank-03 Cathodic Protection System**SYSTEM ID:** 030-CP-004**SUB-SYSTEM NAME:****SUB-SYSTEM ID:**

| NO | DESCRIPTION | CAT | ACTION BY | DISP | CLEARANCE APPROVED BY |
|----|------------------------------------|-----|-----------|------|-----------------------|
| 1- | Cables should be laying. | A | PTJ | | |
| 2- | Cables should be Terminated | A | PTJ | | |
| 3- | Transformer should be earthed. | B | TTJ | | |
| 4- | A.C Power cable must be connected. | A | PJT | | |
| 5- | Test post must be checked | A | PJT | | |
| 6- | Stolen tags must be installed | C | PET | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

CAT: CATEGORY(A,B,C), ACTION BY: (ENPPI, CONST. CONTRACTOR, SUPPLIER.....), DISP: DISCIPLINE (PIP, MECH, ELECT, INST.....)

| COMPANY | PTJ | ENPPI | PMC |
|---------|-----------------|-------|-----|
| NAME | Mostafa ibrahim | | |
| SIGN. | | | |
| DATE | 28/4/2021 | | |



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

4- System Limits Marked Up P&ID



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

5- System Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

6- Piping Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

6.01- Piping Test Packs



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

6.02- Piping Pre-commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

7- Piping Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

7.01- Service Test, GLT, CLT and N2 Purging Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

7.02- Piping Commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8- Mechanical pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8.01- System Mechanical Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8.02- Equipment Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8.03- Equipment Datasheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8.04- Boxing-up Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8.05- Grouting Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8.06- Pre-Alignment Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

8.07- Mechanical Pre-Commissioning Checklists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

9- Mechanical Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

9.01- Final Alignment Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

9.02- Motor Solo Run Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

9.03- Mechanical Run Test (MRT) Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

9.04- Mechanical Commissioning Checklists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

9.05- Mechanical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10- Instrumentation Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.01- System Instrument Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.02- Instrument Data Sheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.03- Instrument Cable Schedule



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.04- System Instrumentation Wiring Diagram



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.05- Hook-up Drawing (Mechanical & Pneumatic)



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.06- Instruments Cables Schedule



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.07- Instruments Cables Laying Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.08- Instruments Cables Termination Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.09- Instruments Cables Testing Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.10- Instruments Calibration Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.11- Instrument Loop Checks Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.12- Instrumentation Pre-Commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

10.13- Instrumentation Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

11- Instrumentation Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

11.01) Instrumentation Function Test Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

11.02- Instrumentation Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12- Electrical Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.01- System Electrical Index

| Tag Number | Tag Description | Form Type | Check Forms ID |
|------------|------------------------------------|-----------|----------------|
| 030-CP-004 | Tank-03 Cathodic Protection System | N/A | EPC BY PTJ |

Cathodic Protection

EPC BY PTJ

EPC BY PTJ

N/A

EPC BY PTJ





Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.02- Electrical Drawings

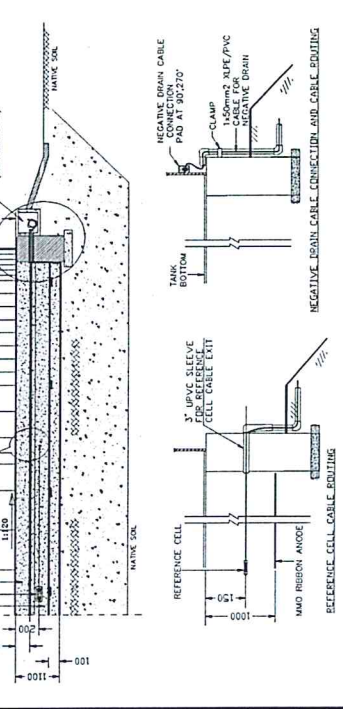
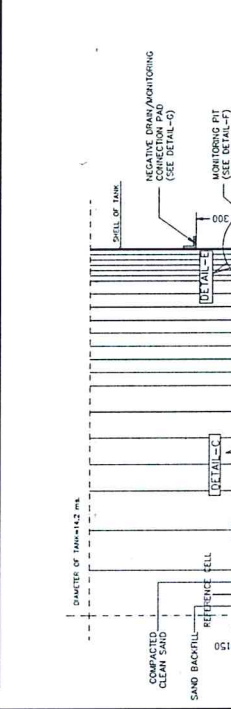
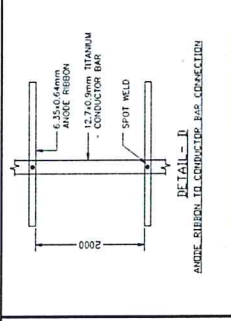
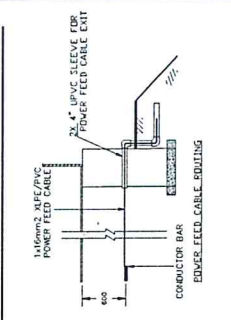
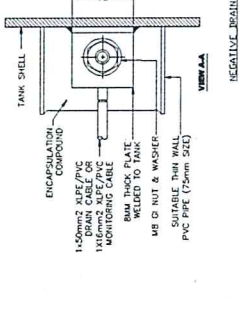
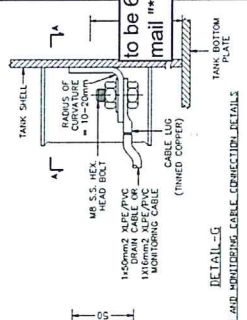
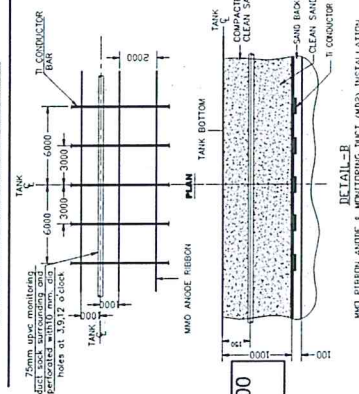
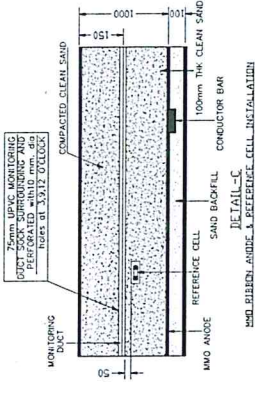
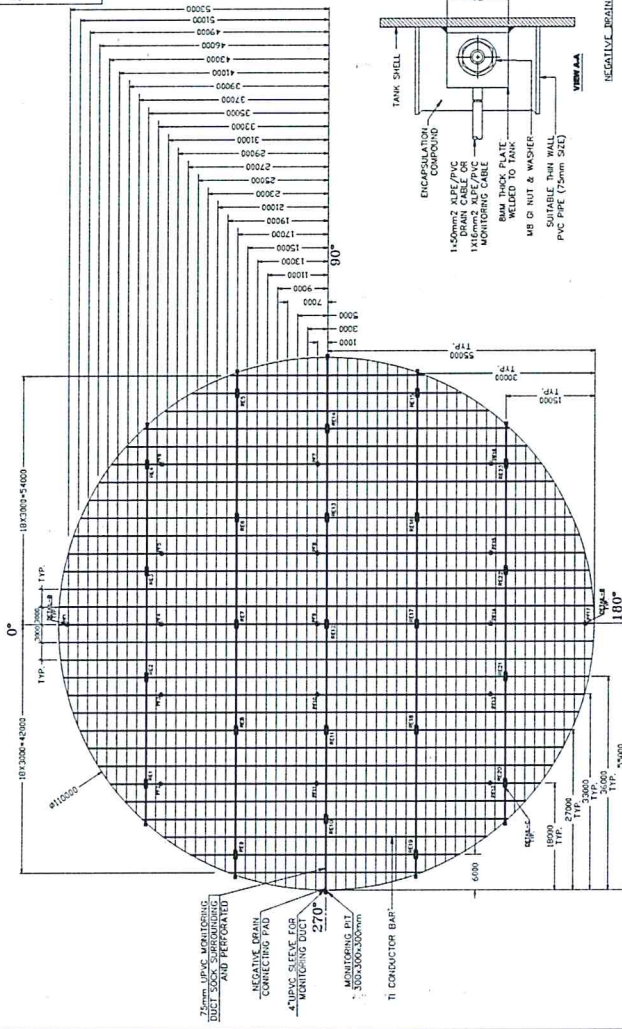
SUPPLIER'S DOCUMENT COVER PAGE (FOR A4/A3 DOCUMENTS ONLY)

| | | | |
|---|---|--|-----------------------------|
| SUPPLIER'S NAME : | Petrojet | | |
| PURCHASE ORDER No : | 01251-100-116-2-Q | | |
| DOCUMENT TITLE : | External Cathodic Protection system drawing for Crude Oil Storage Tanks | | |
| TOTAL No OF PAGES : | Cover +1 | | |
| SUPPLIER'S ORDER No : | | | |
| | | | |
| SUPPLIER'S OWN DOCUMENT No | SUPPLIER'S REVISION | DATE | SUPPLIER APPROVAL SIGNATURE |
| 2019/CRUDE OIL-ALL TANKS-30-D-3-CP-01 | 0 | 010., 9, 2019 | Magdy |
| | 1 | 18/9/2019 | Magdy |
| | 2 | 30/9/2019 | Magdy |
| | | | |
| | | | |
| | | | |
| SUPPLIER DOCUMENT REVIEW | | PROJECT TITLE : EGPC Crude Oil Tank FARM | |
| <p>PERMISSION TO PROCEED DOES NOT CONSTITUTE ACCEPTANCE OR APPROVAL OF DESIGN DETAILS, CALCULATIONS, ANALYSIS, TEST METHODS OR MATERIALS DEVELOPED OR SELECTED BY SUPPLIER FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.</p> | | ENPPI PROJECT NUMBER : 01251-100 | |
| | | PACKAGE DESCRIPTION : Crude Oil Storage Tank | |
| <input checked="" type="checkbox"/> 1. WORK MAY PROCEED. | | EQUIPMENT TAG : XX-T-01/2/3/4 -All Tank | |
| <input type="checkbox"/> 2. REVISE AND RESUBMIT IN ACCORDANCE WITH COMMENTS, WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED. | | CODE IDENTIFIER : D99 | |
| <input type="checkbox"/> 3. REVISE AND RESUBMIT, (MAJOR COMMENTS) WORK MAY NOT PROCEED. | | DOCUMENT NUMBER | REV |
| <input type="checkbox"/> 4. REJECTED, (REASON TO BE SPECIFIED ON THE DOCUMENT). | | | |
| <input type="checkbox"/> 5. HOLD FOR A SPECIFIC REASON (TO BE SPECIFIED ON THE DOCUMENT). | | 1251-100-116-02-XX-D99-022 | 2 |
| NAME: Ahmed Kamal Abu ElMagd | | | |
| SIGNATURE: A. <i>ElMagd</i> | | DATE: Oct. 01, 2019 | |

Code 1

10000-Z-000-PM1-FRM-0033 (11/14)

NOTES:-
To avoid clashes for the tank items below tank (including tank sump / piping with anodes grid system replica (model) for these items shall be installed prior to installation of the anode ribbons to ensure that the anodes system not clashing with any item.



| REV. | DATE | DESCRIPTION | DRAWN | DESIGN | CHECK | APPR. |
|------|------------|-------------------------|---------|---------|--------|----------|
| 2 | 30-09-2019 | ISSUED FOR CONSTRUCTION | Ramadan | A. SAAD | H. ALI | A. FAGAD |
| 1 | 18-09-2019 | ISSUED FOR CONSTRUCTION | Ramadan | A. SAAD | H. ALI | A. FAGAD |
| 0 | 28-08-2019 | ISSUED FOR APPROVAL | Ramadan | A. SAAD | H. ALI | A. FAGAD |

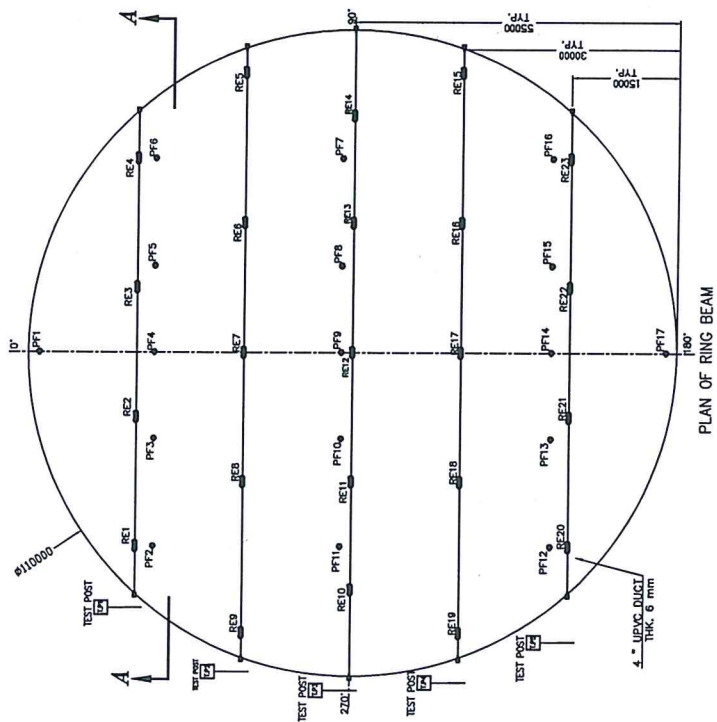
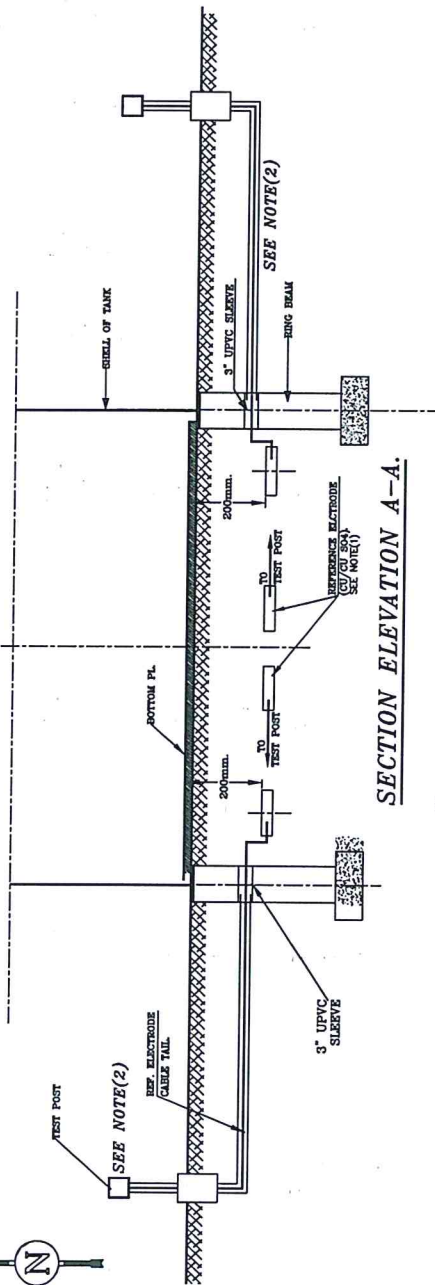
PETROJET
THE PETROLEUM PROJECTS
AND TRADING CORPORATION
Jeddah, K.S.A.
PROJECT: EGPC CRUDE OIL TANK FARM
CLIENT: ENPHI / EGPC
EXTERNAL CATHODIC PROTECTION SYSTEM DRAWING
FOR CRUDE OIL STORAGE TANKS

DWG. NO. 1251-100-116-02-XX-099-022
SHEET NO. 1/1
REVISION 2



NOTES:-

- 1) THIS REFERENCE ELECTRODE IS USED ONLY DURING COMMISSIONING TO MEASURE THE POTENTIAL DROP AGAINST THE SECOND ELECTRODE.
- 2) TEST POST WILL BE INSTALLED AT ABOUT 5m.
- 3) ANY CLASHES SHALL BE AVOIDED AT SITE DURING INSTALLATION.



| | | | | | |
|---|------------------|---|----------------|----------|----------|
| 1 | 14-06-2018 | ISSUED FOR CONSTRUCTION | A. SAAD | E. ALI | A. HADAD |
| 2 | 14-06-2018 | ISSUED FOR APPROVAL | A. SAAD | E. ALI | A. HADAD |
| REV. | DATE | DESCRIPTION | DESIGN | CHECK | APPR. |
| PETROJET THE PETROJAHIL PROJECTS AND TECHNICAL CONSULTANTS CO. P.O. BOX 1251-100-116-02-XX-099-023 DUBAI, U.A.E. | | | | | |
| PROJECT: BOPC CRUDE OIL TANK FARM CLIENT: BOPC / BOPC EXTERNAL CATHODIC PROTECTION PERMANENT REFERENCE ELECTRODE INSTALLATION DRAWING FOR CRUDE OIL STORAGE TANKS | | | | | |
| SCALE: AS SHOWN | DATE: 14-06-2018 | PROJECT NO.: 1251-100-116-02-XX-099-023 | SHEET NO.: 1/1 | REVISION | |

SUPPLIER'S DOCUMENT COVER PAGE (FOR A4/A3 DOCUMENTS ONLY)

SUPPLIER'S NAME : Petrojet

PURCHASE ORDER No : 01251-100-116-2-Q

DOCUMENT TITLE : External Cathodic Protection Schematic Layout for Crude Oil Storage Tanks

TOTAL No OF PAGES : Cover +1

SUPPLIER'S ORDER No :

SUPPLIER'S OWN DOCUMENT No

SUPPLIER'S
REVISION

DATE

SUPPLIER APPROVAL
SIGNATURE

0

010., 9, 2019

Magdy

1

18/9/2019

Magdy

2019/CRUDE OIL-All Tank--30-D-3-CP-03

SUPPLIER DOCUMENT REVIEW

PROJECT TITLE : EGPC Crude Oil Tank Farm

PERMISSION TO PROCEED DOES NOT CONSTITUTE ACCEPTANCE OR APPROVAL OF DESIGN DETAILS, CALCULATIONS, ANALYSIS, TEST METHODS OR MATERIALS DEVELOPED OR SELECTED BY SUPPLIER FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.

ENPPI PROJECT
NUMBER : 01251-100

PACKAGE
DESCRIPTION : Crude Oil Storage Tank

☒ 1. WORK MAY PROCEED.

EQUIPMENT
TAG : XX-T-01/2/3/4 -All Tank

☐ 2. REVISE AND RESUBMIT IN ACCORDANCE WITH COMMENTS, WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED.

CODE
IDENTIFIER : C99

☐ 3. REVISE AND RESUBMIT, (MAJOR COMMENTS) WORK MAY NOT PROCEED.

DOCUMENT NUMBER

REV

☐ 4. REJECTED, (REASON TO BE SPECIFIED ON THE DOCUMENT).

☐ 5. HOLD FOR A SPECIFIC REASON (TO BE SPECIFIED ON THE DOCUMENT).

1251-100-116-02-XX-D99-024

0

NAME: Ahmed Kamal Abu ElMagd

SIGNATURE: A. ElMagd

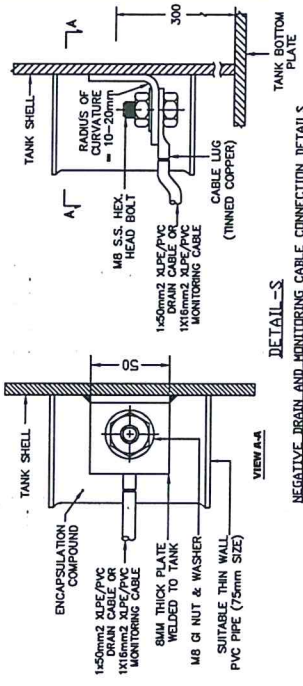
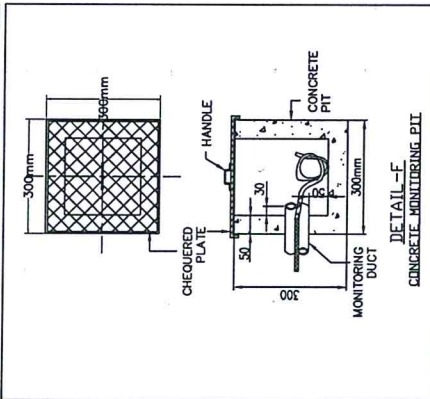
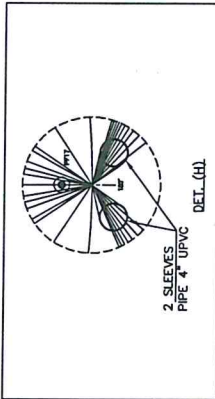
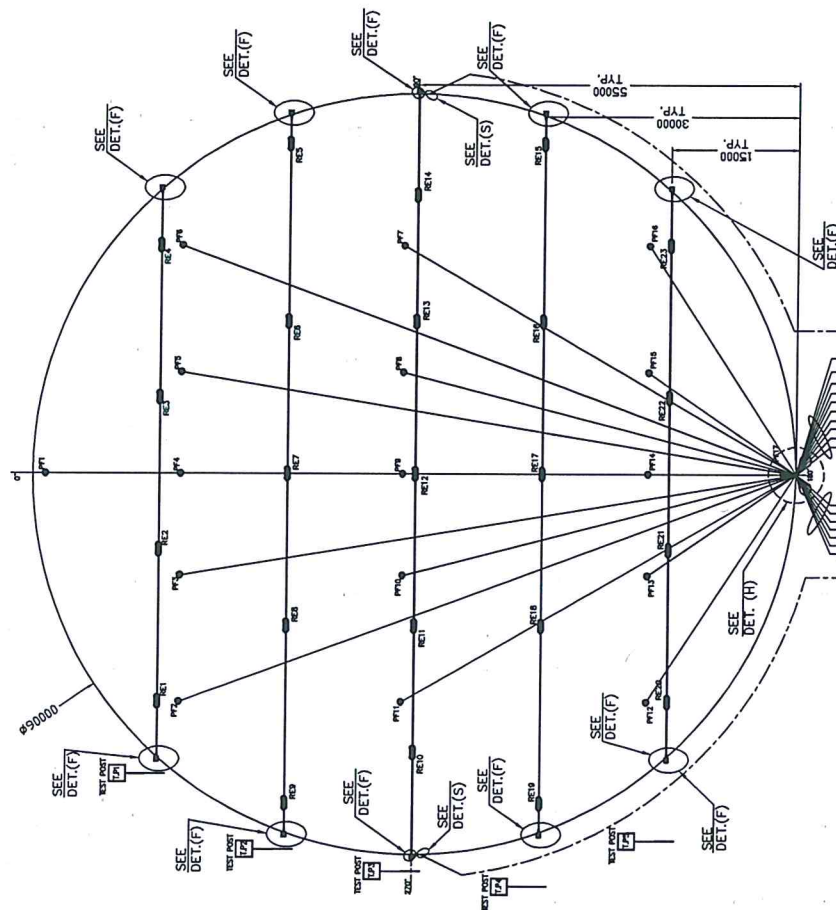
DATE : Sept. 26, 2019

Code 1

10000-Z-000-PM1-FRM-0033 (11/14)

NOTE:

- TR UNIT - TRANSFORMER RECTIFIER UNIT
 - AJB - ANODE JUNCTION BOX
 - TP(1 TO 5) - TEST POST
 - PF(1 TO 17) - POWER FEEDS
 - RE(1 TO 23) - REFERENCE ELECTRODE
 - POSITIVE HEADER CABLE
 - NEGATIVE HEADER CABLE
 - TR UNIT - TRANSFORMER RECTIFIER UNIT
- ANY CLASHES SHALL BE AVOIDED AT SITE DURING INSTALLATION.




| REV. | DATE | DESCRIPTION | DESIGN | CHECK | APPR. |
|------|------------|---------------------------|----------|---------|---------|
| 1 | 19-08-2019 | DESIGNED FOR CONSTRUCTION | REVISION | A. SAAD | A. SAAD |
| 0 | 19-08-2019 | DESIGNED FOR APPROVAL | REVISION | A. SAAD | A. SAAD |

PETROJET
THE PETROLIUM PROJECTS
AND TECHNICAL CONSULTANTS CO.
CHARTERED ENGINEERS
AND ARCHITECTS

PROJECT: DOPC CRUDE OIL TANK FARM
CLIENT: ENPPH / DOPC

EXTERNAL CATHODIC PROTECTION SCHEMATIC LAYOUT FOR CRUDE OIL STORAGE TANKS

SCALE: 1/1
DATE: 19-08-2019
DRAWN BY: A. SAAD
CHECKED BY: A. SAAD
APPROVED BY: A. SAAD

| | | | | |
|---|-------------|--|-----------|---------|
|  | Doc. no.: | CR35913 – II01 | Rev. No.: | 0 |
| | Doc. Title: | II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION | Page: | 5 of 15 |

Please refer to the project drawing "Doc number 1251-100-116-002-D99-005 External Cathodic Protection Permanent Reference Electrode Installation drawing for Fire Water Storage Tanks" for precise location / orientation of these pipes.

The slotted pipe will have a galvanized steel rope passed through entire length of the pipe as it is being assembled and terminated at each end to be used a draw cord The rope is tied wrapped to the Portable Cu/CuSO₄ reference electrode which in turn has a 120m cable tail to allow passage under the entire tank base. When not in use the cable tail / Galvanised steel wire should be safely coiled and stored in the monitoring pits provided.

The PVC is pipe is supplied in 3 to 5.8m lengths and is joined by M/F threaded connection.


The geotextile sleeve is provided loose to be fitted during construction to prevent the backfill media from entering the slotted tube.

For the portable cell to operate successfully it is suggested to wrap in a wet sponge material creating an interference fit within the PVC tube.

Ensure the insulation of the cables is not damaged during the pulling of the cables.



The slotted monitoring pipe should be laid on a sand bank running across the tank base 150mm above the MMO Grid and then routed through the 4" conduit at plant east and west side of the ring beam.

| | | | | |
|---|-------------|--|-----------|---------|
|  | Doc. no.: | CR35913 – II01 | Rev. No.: | 0 |
| | Doc. Title: | II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION | Page: | 7 of 15 |

5.2 MMO RIBBON & CONDUCTOR BAR

Please refer to:

Document Number 1251-100-116-02-XX-D99-022 External Cathodic Protection System Drawing For Crude Oil Storage Tank

Document Number 1251-100-116-002-D99-004 External Cathodic Protection System Drawing For Fire Water Storage Tank

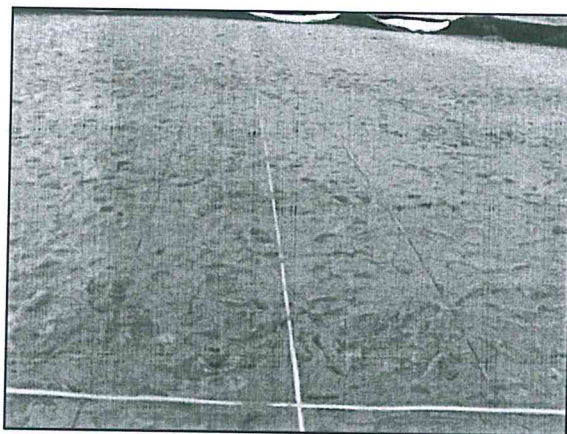
For the successful operation of the Cathodic Protection system, it is imperative that the MMO Ribbon is installed at a uniform minimum depth of 600mm below the tank bottom.

The foundations of the tanks shall be constructed to the point where they would be at least 350 to 400mm (layer of soft sand) below the bottom of the tank. It must be noted that the MMO Ribbon anodes and conductor bar assembly **MUST** be placed above the membrane.


The membrane should be at 100mm below the proposed location of MMO ribbon grid. In addition, it is essential that the membrane shall cover the entire inner face of the concrete ring beam foundations to isolate the reinforcing rebar from the anode network. The Civil Contractor shall confirm the membrane is a uniform 700 mm depth below the proposed bottom of the tank, before proceeding further.

A 100mm layer of chloride free, clean washed sand shall be installed directly above the membrane, which shall be compacted according to the project standard and the anode shall be installed on this layer. The pattern of the anodes and conductor bar shall be as shown in the referenced drawings.

The anode ribbon shall be placed onto the sand layer in the pattern shown in the relevant design drawing, and then the Titanium conductor bars laid out. Where appropriate, the anodes shall be weighted down to avoid movement however, great care shall be taken to ensure that the coating of the anodes is not scratched or damaged in any way.

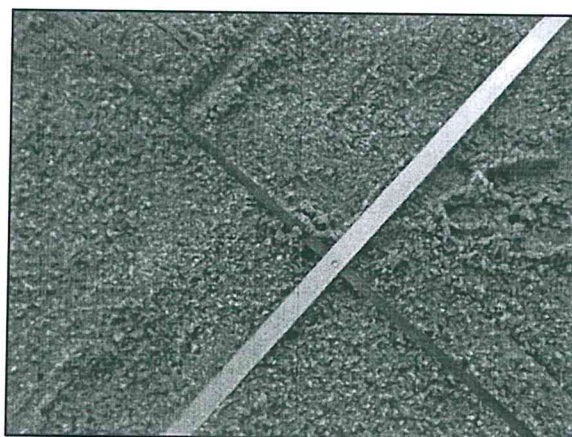


Grid style layout of anode ribbon and conductor bars

| | | | | |
|---|-------------|--|-----------|---------|
|  | Doc. no.: | CR35913 – II01 | Rev. No.: | 0 |
| | Doc. Title: | II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION | Page: | 8 of 15 |

The spot welder, provided shall be used for all welds and shall be operated in accordance with the manufacturer's Operation Manual by an experienced operative – see appendix 2 for operation instructions.

A sample test weld between the anode ribbon and conductor bar should first be carried out in order to ensure good quality welds. A pull test (by hand) to ensure the weld cannot be pulled apart. A resistance test between the welded element shall be carried to ensure the weld integrity. The acceptance criteria for the resistance between the welded elements shall be 0.1ohm using a calibrated multimeter.



MMO Ribbon anode spot welded to titanium conductor

The sample spot weld shall be inspected by a Cathodic Protection Engineer or other responsible authorised person.

Each weld carried shall be tested with a pull test (by hand) and have a resistance test carried out. The results shall be recorded. The settings on the spot welder unit should be also recorded.

The recommended setting is as follows:


- MMO ribbon anode to MMO ribbon anode: 2 seconds.
- MMO ribbon anode to Titanium conductor bar: 3 seconds
- Titanium conductor bar to Titanium conductor bar: 5 seconds

At each and every crossover of the anode ribbon with the conductor bar, the anode shall be resistance welded, (spot welded) to the conductor bar a minimum of twice. Where necessary, anodes and conductor bars shall be extended using the same procedure.

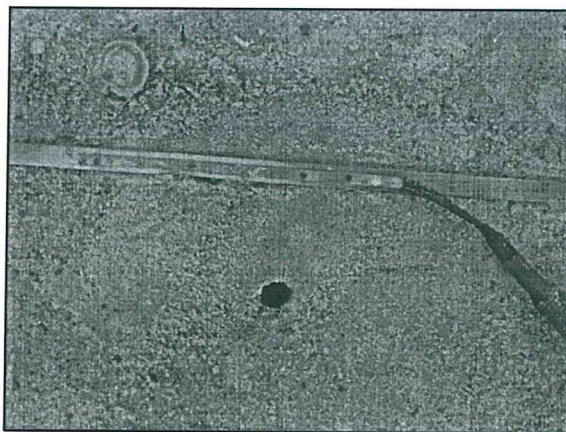
5.3 POWERFEED CONNECTORS

The power feed connection locations shall be identified as per the reference drawings.

Power feed connectors are factory connected to the 16mm² cable using a splice kit. The Conductor bar tail from the power feed cable encapsulation shall be connected to the conductor

| | | | | |
|---|-------------|--|-----------|---------|
|  | Doc. no.: | CR35913 – II01 | Rev. No.: | 0 |
| | Doc. Title: | II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION | Page: | 9 of 15 |

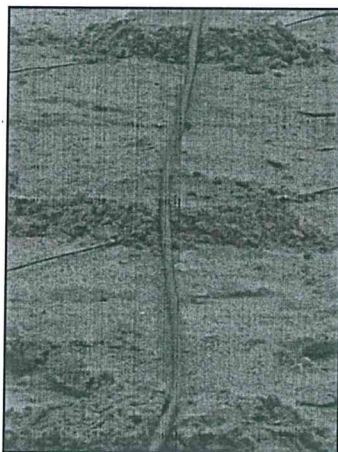
bar on the anode grid using where appropriate resistance welding (spot welding) in a least 5 location posts (refer Detail A of reference drawing).



Power Feed connector spot welded to titanium conductor


Upon completion of the power feed assemblies to the grid, the power feed cables shall be routed to the chosen exit point from the foundations, and routed out of the foundations via the 4" dedicated pipe cast into the concrete ring beam, as shown in the design drawings.

A 25mm 'sand bridge' shall be made at each power feed cable / anode crossing location to ensure that they are not in direct contact. Collect all anode power feed cables together and ensure that they are tagged at each end with their respective number, then ensure all cable have been routed out of the foundations via the exit pipe without damaging the cable tag.



Sand bridge used to ensure separation between Power Feed Cables and Anode / Conductor Bar –
NOTE actual power feed cables supplied are Red colour!

The entire anode, conductor bar and cable assembly shall be covered with another layer of chloride free, clean washed sand, which shall be smoothed flat and compacted. The Civil Contractor shall confirm the sand layer is uniform and at least 50mm above the MMO Ribbon layer.

| | | | | |
|---|-------------|--|-----------|----------|
|  | Doc. no.: | CR35913 – II01 | Rev. No.: | 0 |
| | Doc. Title: | II01 INSTALLATION INSTRUCTIONS FOR CATHODIC PROTECTION | Page: | 10 of 15 |

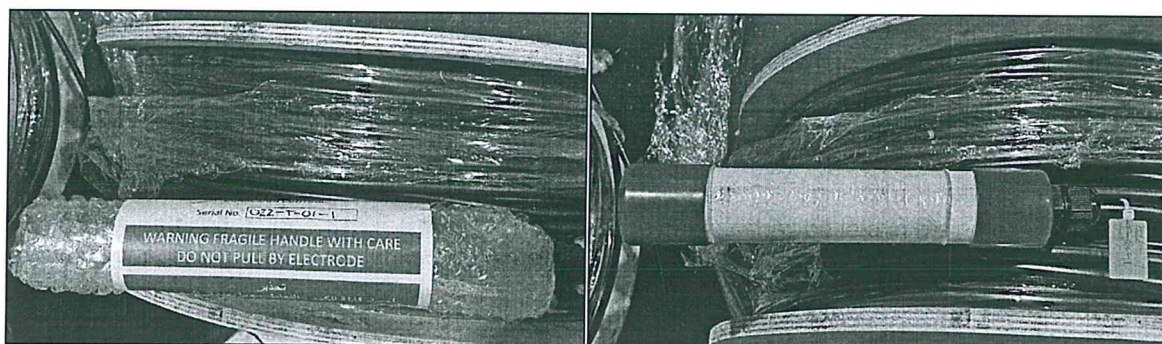
The power feed cables shall be routed from the tank to the location of the Anode Junction Box (AJB) installed adjacent to the tank. At all times the cables shall be laid in a single length without further splicing, free from kinks and excessive bends.

Please refer to paragraph "5.10 installation procedure for cables laying"

5.4 PERMANENT REFERENCE ELECTRODE

Please refer to the relevant drawings to ensure the correct positioning of the reference electrodes.

Please ensure not to pull the cable from the reel by handling the reference electrode.



Permanent Reference Electrodes showing protection packaging and film wrapping

Please ensure to fully remove any projective packaging and film wrapping from around the reference electrode.

A 100mm layer of chloride free, clean washed sand shall be installed directly above the titanium conductor bar and the Mixed Metal Oxide Ribbons prior to placing the Permanent Cu/CuSO₄ reference electrode c/w cable tail.

Collect all cables and ensure that they are tagged at the tail end with their respective number, then all cables shall be routed out the foundation via the exit pipe.

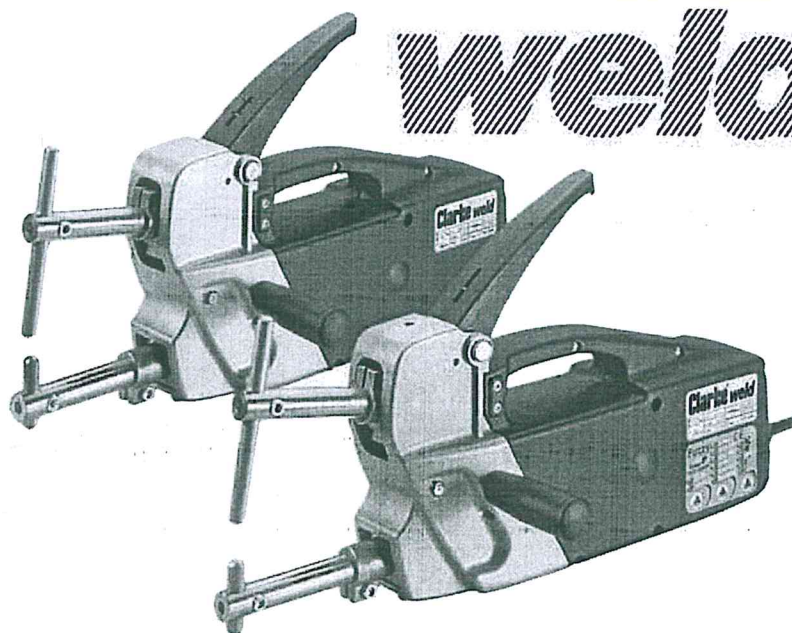
The Permanent Cu/CuSO₄ cables shall be routed from the tank to the location of the Test Post Junction Box installed adjacent to the tank. At all times the cables shall be laid in a single length without further splicing, free from kinks and excessive bends.

Please refer to paragraph "5.10 installation procedure for cables laying"

5.5 POTENTIAL MONITORING FACILITIES (PVC TUBE)

When at least a 150mm layer of sand over the MMO ribbon has been completed, slotted monitoring pipe shall be installed as shown in the relevant design drawing, ensuring that the pipe is straight and flat to allow a portable reference electrode to pass without hindrance.

Clarke[®] weld



SPOT WELDER

Models CSW6T & CSW13T

Part Nos. 6030005 & 6030010

0204

OPERATING & MAINTENANCE INSTRUCTIONS

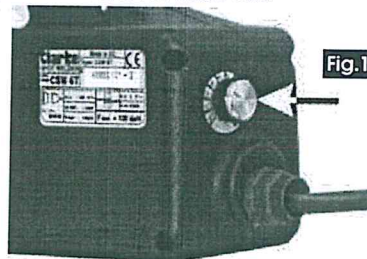


FEATURES

Model CSW6T

This 230V 50Hz, portable Spot Welder is provided with an electronic timer which allows precise control of welding time. The control knob is arrowed in Fig. 1.

Electrode pressure may be mechanically adjusted from 40 to 120kg, to spot weld low carbon sheet steel up to 1 + 1 mm in thickness.

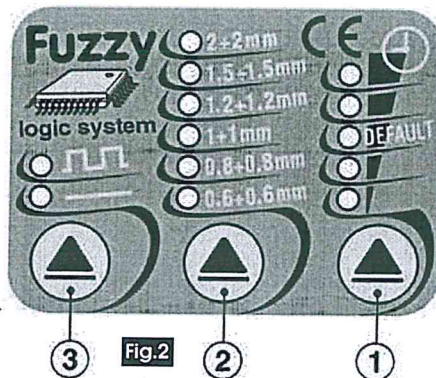


Model CSW13T

The most important features of this 230V 50Hz Portable Spot Welder are controlled by a microprocessor, managed from the control panel, shown in Fig. 2. These features are:

1. Welding time, set according to the thickness of metal to be welded.
2. Changing selection for Welding thickness
3. Changing resistance welding machine operating mode... normal or pulse.

Selecting 'PULSE' mode improves welding capacity on material with high yield points or materials with protective coatings. The pulsation period is preset and does not require adjustment.



4. Electrode pressure may be mechanically adjusted from 40 to 120kg, to spot weld low carbon sheet steel up to 2 + 2 mm in thickness.

Both Models

- 120mm Electrode Arms and standard electrodes are provided.
- An eye bolt may be fitted to the machine (see your Clarke dealer), for use in supporting the machines weight when repetitive welds are required (see your Clarke dealer). **IMPORTANT! When using the Eye Bolt, Take care NOT to screw it more than 8mm into the screw hole.**

UNPACKING & PARTS IDENTIFICATION

Unpack and lay out the components, checking against the following list. Please report any damage which may have occurred during transit, to your CLARKE dealer immediately.

- | | |
|----------------------------------|--------------------------|
| 1. Welder complete. | 5. 2 x Hex. Wrenches - D |
| 2. 1 x Handle - A | 6. 1 x M6 Screw - F |
| 3. 2 x Electrode Holders - B | |
| 4. 2 x Electrodes (straight) - C | |

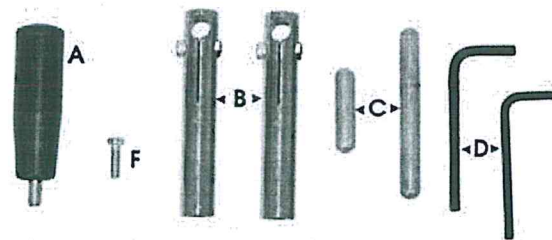


Fig.3

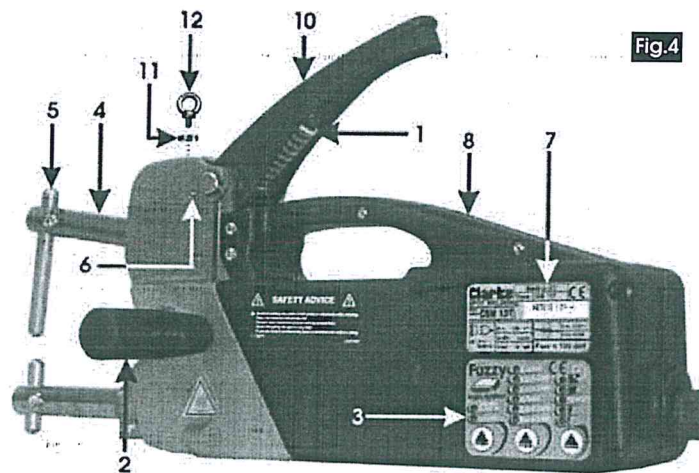


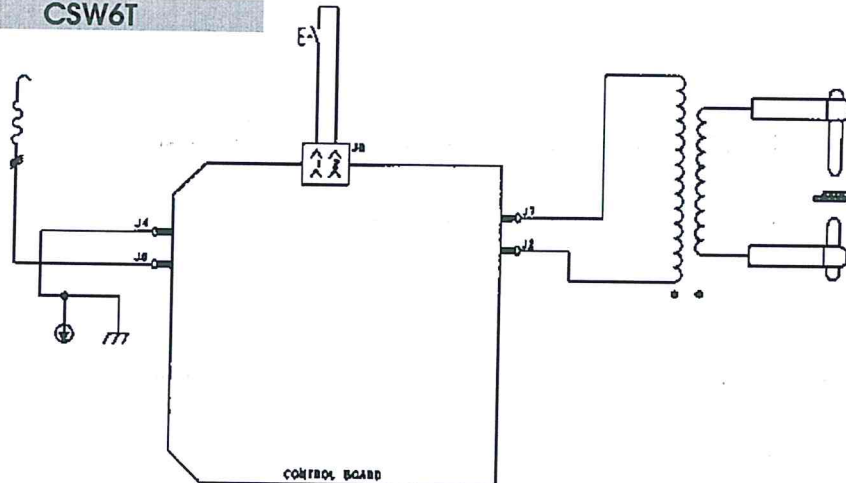
Fig.4

- | | |
|----------------------------|----------------------------|
| 1. Pressure Adjuster screw | 7. Data Label |
| 2. Handle | 8. Microswitch |
| 3. Control panel (13T) | 9. Weld Time Adjuster (6T) |
| 4. Electrode Arm | 10. Operating Lever |
| 5. Electrode (Long) | 11. Spacer (Optional) |
| 6. Screw Locating Hole | 12. Lifting Eye (optional) |

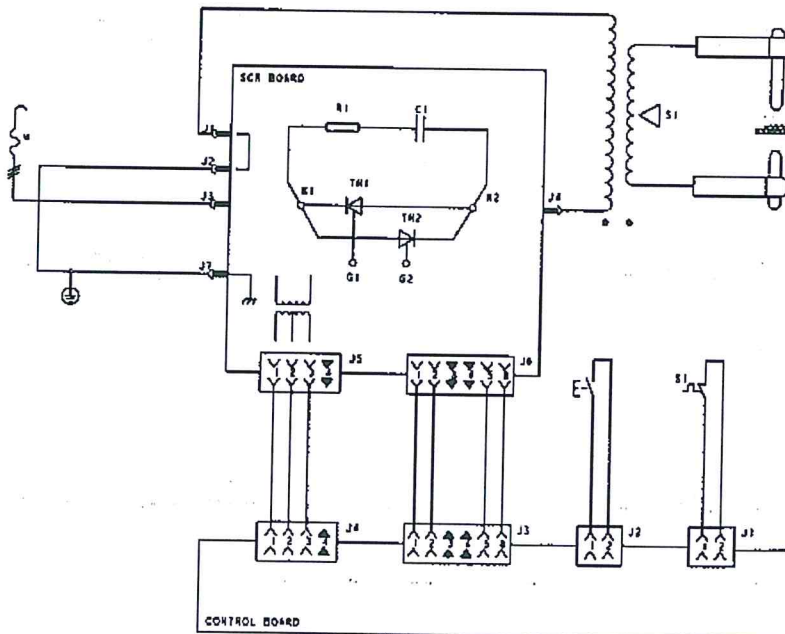


SCHEMATIC WIRING DIAGRAMS

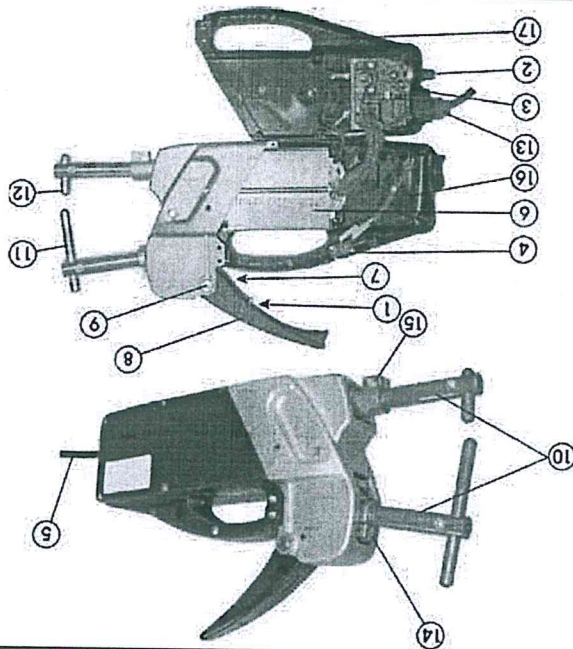
CSW6T



CSW13T

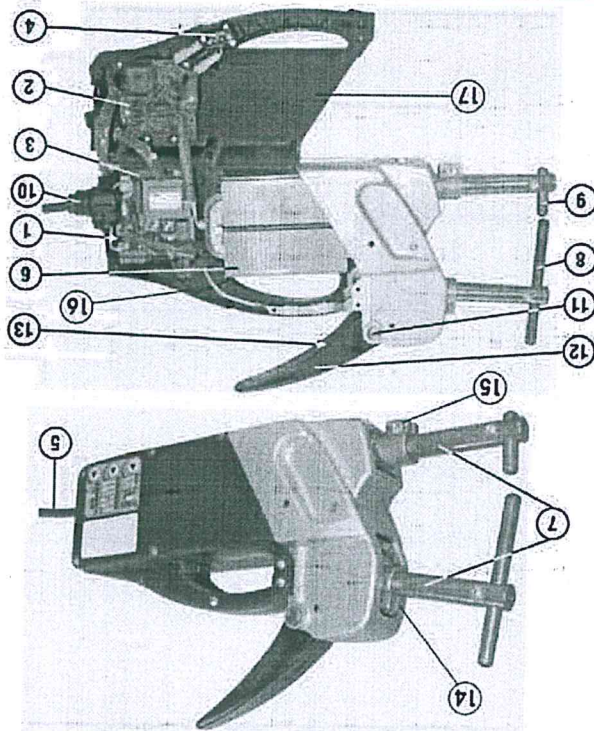


SPARE PARTS - CSW6T

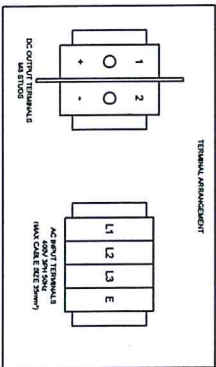
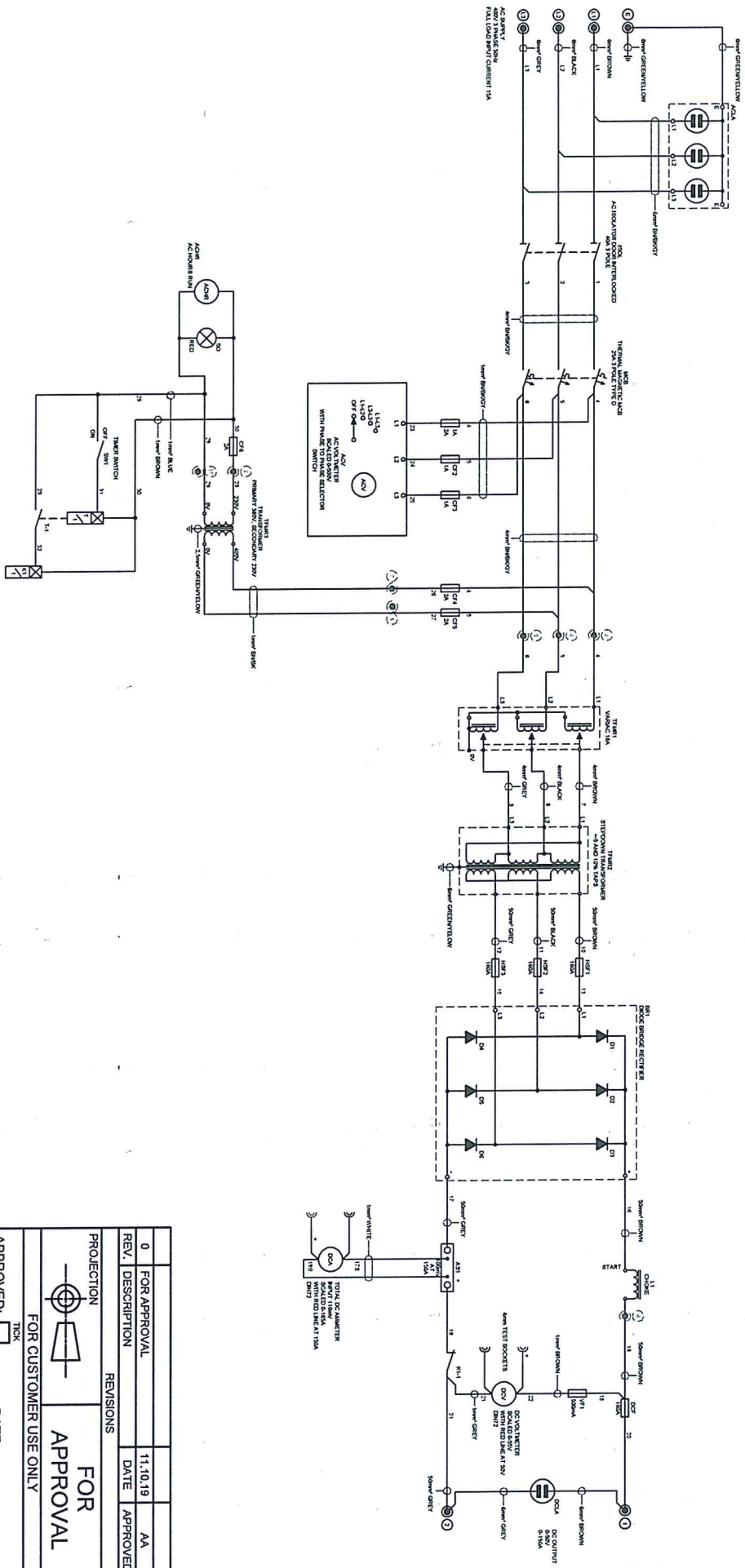


| No. | Description | No. | Part Number |
|-----|--|-----|-------------|
| 1 | Bush | 1 | TT322518 |
| 2 | Potentiometer (Adjuster) Knob | 1 | TT112299 |
| 3 | Timer PCB | 1 | TT114236 |
| 4 | Microswitch | 1 | TT122393 |
| 5 | Mains Cable | 1 | TT132104 |
| 6 | Transformer | 1 | TT169152 |
| 7 | Adjuster Screw | 1 | TT121263 |
| 8 | Operating Lever | 1 | TT322512 |
| 9 | Pivot Pin | 1 | TT482887 |
| 10 | See Page 13 for full range of Arms | | |
| 11 | See Page 13 for full range of Electrodes | | |
| 12 | See Page 13 for full range of Electrodes | | |
| 13 | Cable Kit - Bushing, Ring Nut | 1 | TT990046 |
| 14 | Upper Arm Clamp | 1 | TT522020 |
| 15 | Lower Arm Clamp | 1 | TT522023 |
| 16 | Left Shell | 1 | TT322509 |
| 17 | Right Shell | 1 | TT322526 |

| No. | Description | No. | Part Number |
|-----|-------------------------------|-----|-------------|
| 1 | Screw | 1 | TT113908 |
| 2 | Control PCB | 1 | TT114070 |
| 3 | Power PCB | 1 | TT114085 |
| 4 | Microswitch | 1 | TT122393 |
| 5 | Mains Cable | 1 | TT132104 |
| 6 | Transformer | 1 | TT169034 |
| 10 | Cable Kit - Bushing, Ring Nut | 1 | TT990046 |
| 11 | Pivot Pin | 1 | TT482887 |
| 12 | Operating Lever | 1 | TT322512 |
| 13 | Adjuster Screw | 1 | TT212163 |
| 14 | Upper Arm Clamp | 1 | TT522020 |
| 15 | Lower Arm Clamp | 1 | TT522023 |
| 16 | Right Shell | 1 | TT322510 |
| 17 | Left Shell | 1 | TT322511 |



SPARE PARTS - CSW131



NOTE: TO BE USED IN CONJUNCTION WITH ELECTRICAL INSTALLATION. SEE DRAWING FOR WIRING AND CONNECTIONS. DC OUTPUT CURRENT: 150A. LAST REVISION NUMBER: 11

| REVISIONS | | FOR APPROVAL | |
|-----------|--------------|--------------|----------|
| REV. | DESCRIPTION | DATE | APPROVED |
| 0 | FOR APPROVAL | 11.10.19 | AA |

PROJECTION

FOR CUSTOMER USE ONLY

APPROVED: ☐ TCK DATE: _____

NAME: _____

SIGNED: _____

BAC

CORROSION CONTROL

PROJECT: CR35913

TITLE: SCHEMATIC DIAGRAM

VARIABLE TRANSFORMER RECTIFIER

AC SUPPLY 400V 50Hz

DC OUTPUT 50V 150A

APPROX WEIGHT (kg): _____ QUANTITY: 29

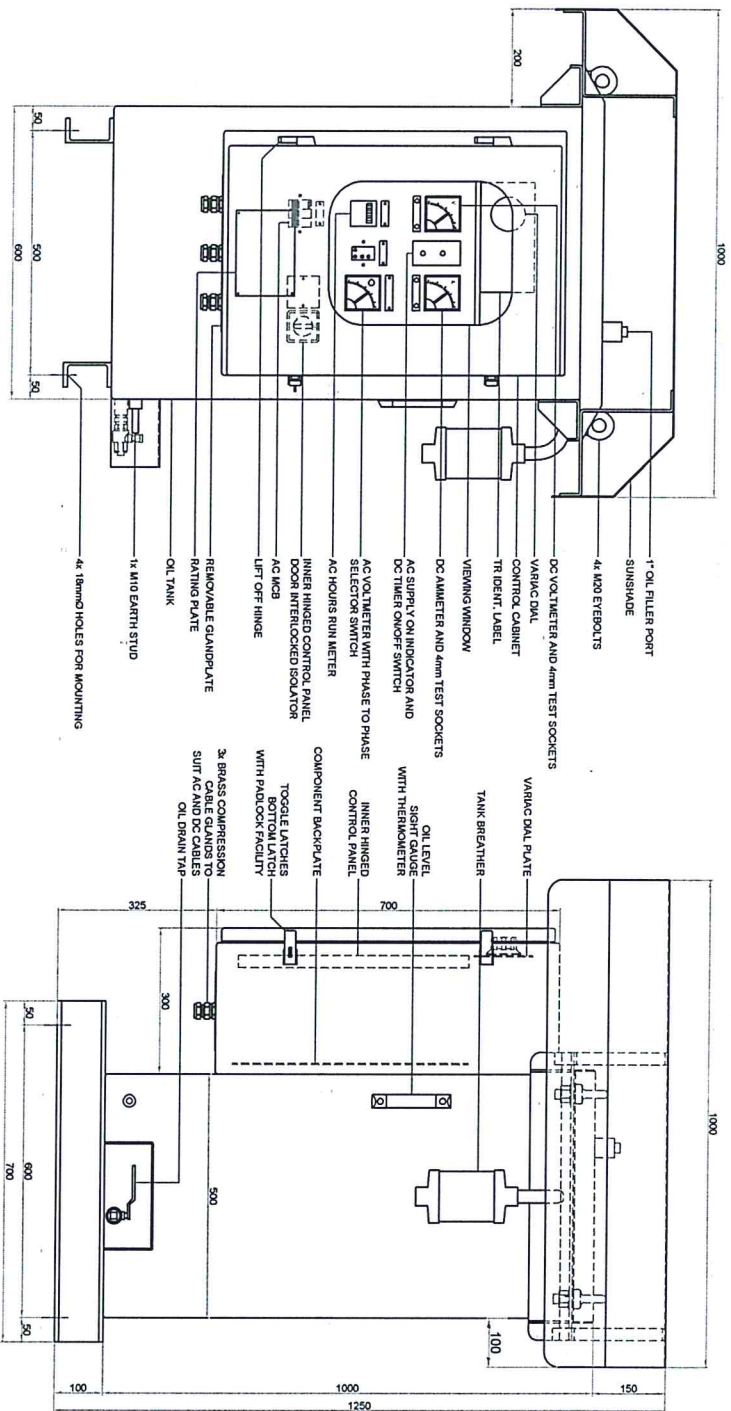
MATERIAL: _____

| NAME | DATE | FINISH |
|-------|----------|--------------|
| DRAWN | 11.10.19 | SHEET 1 OF 1 |

SCALE: A3

DWG NO: CR35913-002

REVISION: -R0



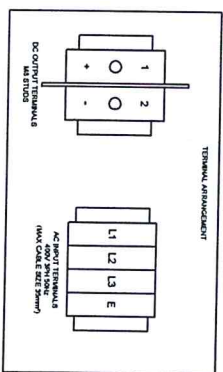
MANUFACTURED FROM
TANK 3mm MILD STEEL SHEET
CABINETS AND SUNSHADE 2mm MILD STEEL SHEET
INGRESS PROTECTION IP65
FINISH: SUITABLE FOR MARINE ENVIRONMENT (CS-4M)
EXTERNAL SURFACES INCLUDING
SHOTBLAST SA2.5
HOT ZINC SPRAY 100 MICRONS
INTERNAL SURFACES INCLUDING
HOT ZINC SPRAY 100 MICRONS
POLYESTER POWDER 70 MICRONS
INTERNAL SURFACES
SHOTBLAST SA2.5
HOT ZINC SPRAY 100 MICRONS
POLYESTER POWDER 70 MICRONS
INTERNAL SURFACES
HOT ZINC SPRAY 100 MICRONS
POLYESTER POWDER 70 MICRONS
COLOUR ALL SURFACES: DARK GREY

| | | | |
|--------|--------------|----------|----------|
| REV. 0 | FOR APPROVAL | 11.10.19 | AA |
| REV. 1 | DESCRIPTION | DATE | APPROVED |

| | | | |
|-----------------------|------|--------------|--|
| PROJECTION | | FOR APPROVAL | |
| FOR CUSTOMER USE ONLY | | | |
| APPROVED: | TICK | DATE: | |
| NAME: | | SIGNED: | |

| | | |
|---------------------|------|---------------|
| MATERIAL: - | | QUANTITY: 7 |
| NAME | DATE | FINISH: - |
| DRAWN | JAC | 11.10.19 |
| SHEET 1 OF 1 | | SCALE: 1:10 |
| DMS NO. CR35913-003 | | REVISION: -R0 |

| | | |
|--|--|--|
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| PROJECT: CR35913 TITLE: GENERAL ARRANGEMENT DRAWING AC SUPPLY 400V 50Hz DC OUTPUT 50V 50A | | CORROSION CONTROL www.bacgroup.com |



BAC
CORROSION CONTROL
www.bacgroup.com

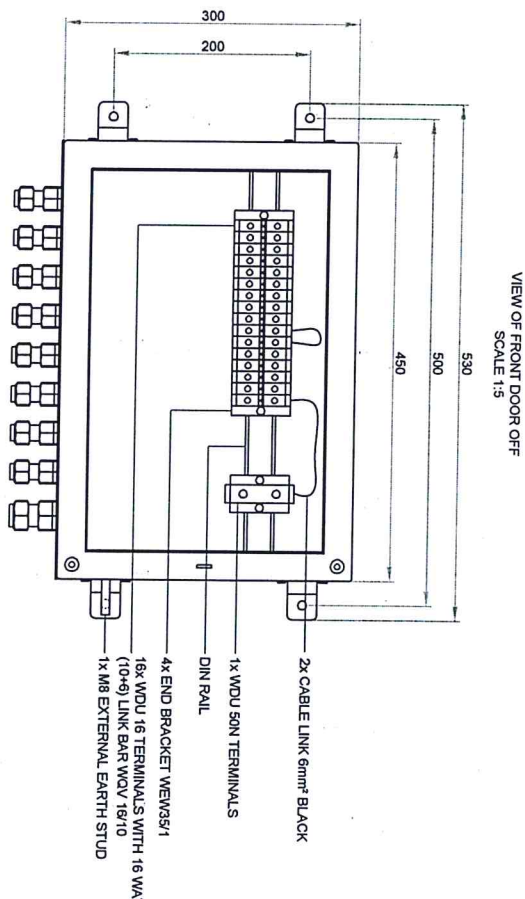
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DE 001-01 200 200
PN

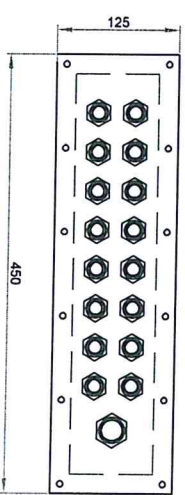
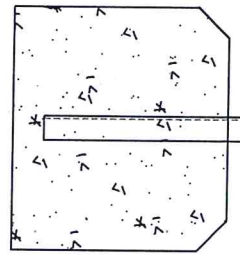
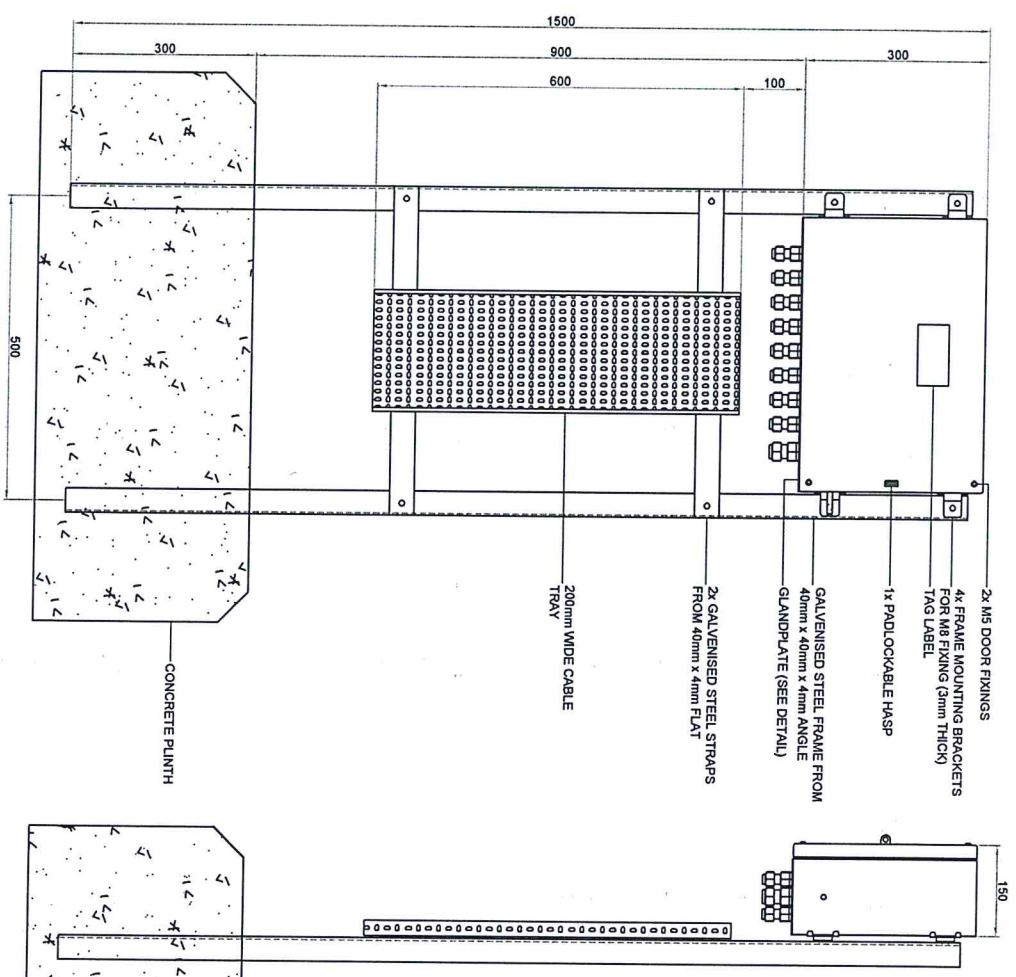
[illegible]

CR35913-004

-RO



- NOTES:
- CABINET MANUFACTURED FROM 1.5mm
 - 316L STAINLESS STEEL
 - CABINET IP65
 - CABINET DOOR WITH HINGE ON LEFT HAND SIDE
 - CABINET FINISH NATURAL BRUSHED



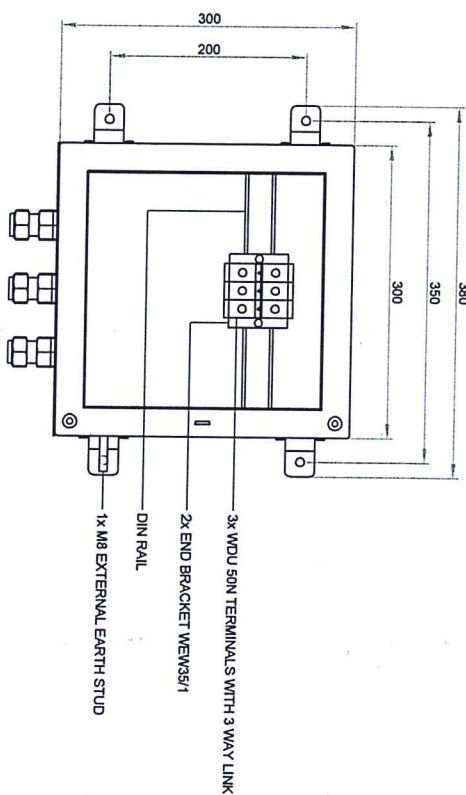
| | | | |
|---------------------|------|--------------------|-----------|
| PROJECT No. CR35913 | | PART No. 014020123 | |
| DRAWN | NAME | DATE | DWG SIZE |
| JAC | | 23/01/20 | A3 |
| DWG No. | | | REVISION: |
| CR35913-005 | | | R0 |

| | | |
|--|--|------|
| APPROVED: <input type="checkbox"/> TDC | | DATE |
| NAME | | |
| SIGNED | | |

| | |
|-----------------------|-----------------------|
| FOR CUSTOMER USE ONLY | |
| REV. | DESCRIPTION |
| 0 | ISSUED FOR PRODUCTION |
| DATE | APPROVED |
| 23/01/20 | JAC |

| | |
|------------------------------|--|
| TITLES | |
| CORROSION CONTROL | |
| GENERAL ARRANGEMENT DRAWING | |
| POSITIVE JUNCTION BOX 16 WAY | |

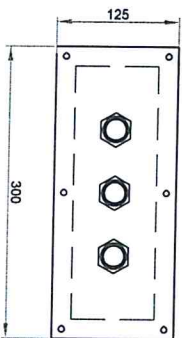
| | |
|--|--|
| BAC | |
| THIS DRAWING DOCUMENT IS THE PROPERTY OF BAC CORROSION CONTROL AND MUST NOT BE DISCLOSED WITHOUT PRIOR WRITTEN CONSENT | |
| ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED | |
| www.bacgroup.com | |



VIEW OF FRONT DOOR OFF
SCALE 1:5

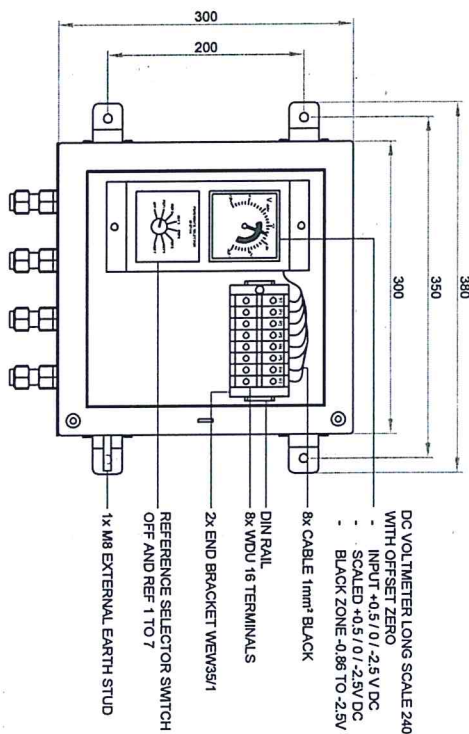
- **CABINET MANUFACTURED FROM 1,5mm**
- **316L STAINLESS STEEL**
- **CABINET IP65**
- **CABINET DOOR WITH HINGE ON LEFT HAND SIDE**
- **CABINET FINISH NATURAL BRUSHED**

GLANDPLATE DETAIL
SCALE 1:5



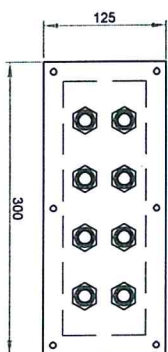
**NICKEL PLATED BRASS CABLE GLANDS TO SUIT:
3x M20 50mm² UNARMORED CABLE**

[illegible]



VIEW OF FRONT DOOR OFF
SCALE 1:5

- NOTES:
- CABINET MANUFACTURED FROM 1.5mm 316L STAINLESS STEEL
 - CABINET IP65
 - CABINET DOOR WITH HINGE ON LEFT HAND SIDE
 - CABINET FINISH NATURAL BRUSHED



GLANDPLATE DETAIL
SCALE 1:5

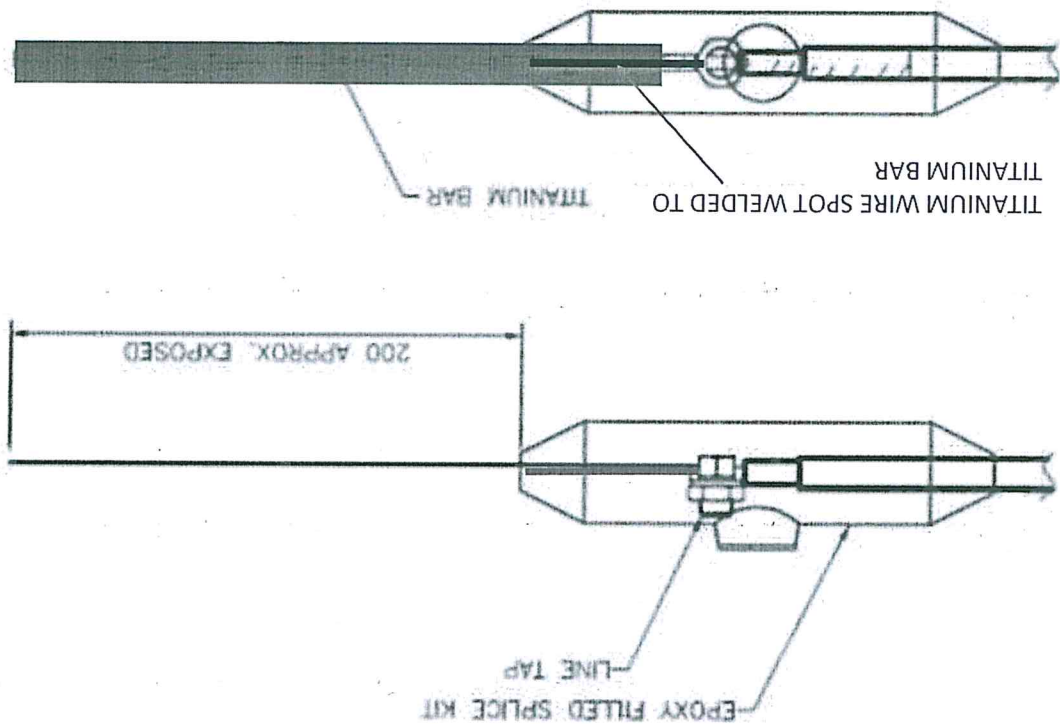
**NICKEL PLATED BRASS CABLE GLANDS TO SUIT:
8x M20S16 10mm² UNARMORED CABLE**

[illegible]

MIXED METAL OXIDE ANODES RIBBON TYPE POWER FEED CONNECTION KIT

APPLICATION : For power feed connections on under tank grid anode system. The power feed connector connects the DC current feeder cable to the Titanium Conductor Bar.

Anode Power Feed Connector comprises 12.7mm width x 0.9mm Thickness x 200mm length Titanium Conductor Bar spot welded to a 100mm length of 3mm dia Titanium Wire. Encapsulation to the DC feeder cable is made by an epoxy splice kit and line tap connector generally as detailed below



Quantity : 551 No (for Crude Oil Tanks)
Powerfeed Connectors supplied with 500m of 16mm² XLPE/PVC Cable
Tail, Colour Red

Quantity : 77 No (for Fire Water Tanks)
Powerfeed Connectors supplied with 160m of 16mm² XLPE/PVC Cable
Tail, Colour Red

BAC
CORROSION CONTROL
MEMBER OF
MIDROC EUROPE

POWER FEED
CONNECTOR



DATASHEET
1.11

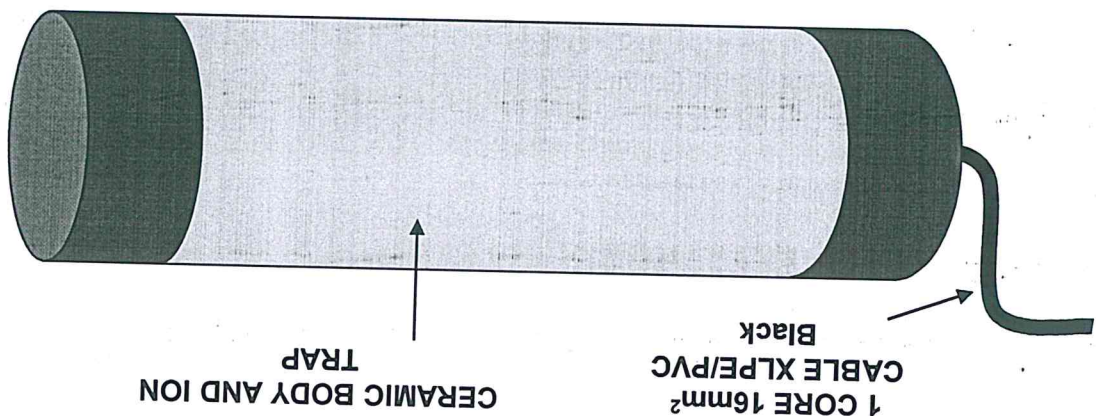
PERMANENT COPPER / COPPER SULPHATE REFERENCE ELECTRODE

This permanent reference electrode is used to measure Cathodic Protection (CP) potentials on buried pipelines, storage tanks and other buried metallic structures to which CP has been applied. Can be used with a pipeline coupon that allows you to take an IR free potential reading without interruption of the CP system.



CU/CUSO4 REFERENCE
ELECTRODE

DATASHEET



| STANDARD SPECIFICATION | |
|--------------------------|---|
| Electrolyte | Saturated Copper Sulphate Gel (98.4% Min Purity Cu/SO ₄ crystals) |
| Electrode Body Materials | High Temperature Fired Ceramic and Ion Trap. |
| Weight (Gross) | Approx 1kg net weight |
| Dimensions | Approx 36mm Dia x 200mm (Bare Dimensions) |
| Cable | 1c x 16mm² XLPE/PVC stranded copper conductor cable, 600/1000V grade, black, 300m length For Crude Oil Tanks / 160m Long for Fire Water Tanks |

Quantity : 783 No for Crude Oil Storage Tanks
42 No for Fire Water Tanks

BAC

CORROSION CONTROL

BAC Corrosion Control Ltd
Stafford Park 11 • Telford • TF3 3AY
United Kingdom

T: +44 (0) 1952 290 321
E: sales@bacgroup.com
W: www.bacgroup.com

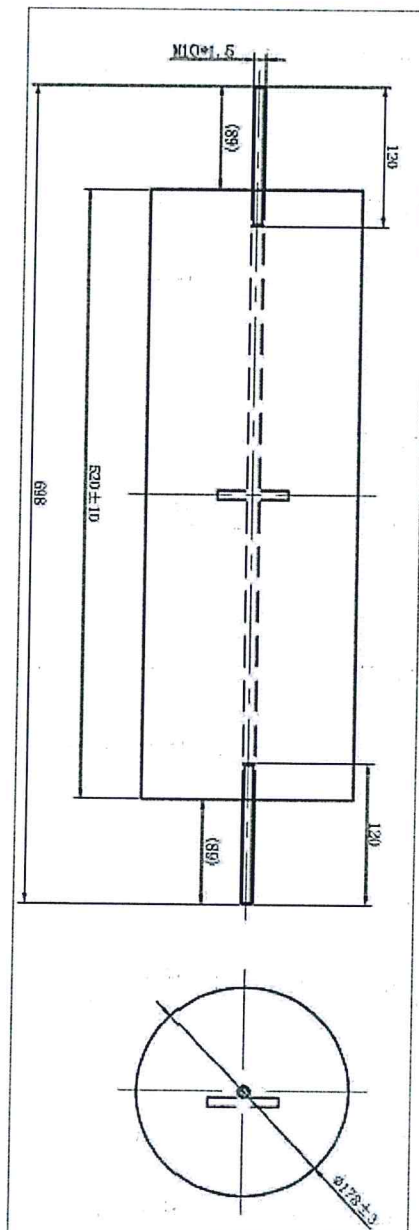
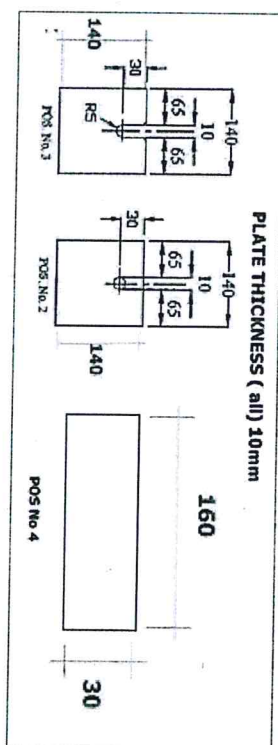
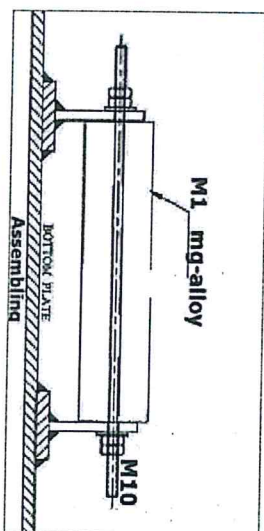


PLATE THICKNESS (all) 10mm



ALLOY COMPONENTS

| | | |
|----|-----------|-------|
| Cu | 0.08 | MAX |
| Al | 5.3 | — 6.7 |
| Si | 0.3 | MAX |
| Fe | 0.005 | MAX |
| Mn | 0.25 | MIN |
| Ni | 0.03 | MAX |
| Zn | 2.5 | — 3.5 |
| Pb | 0.03 | MAX |
| Mg | Remainder | |



CORROSION CONTROL

BAC®

170 Series Digital Multimeters

Versatile meters for field service or bench repair

These meters have the features needed to find most electrical, electro-mechanical and heating and ventilation problems. They are simple to use and have significant improvements over Fluke's original 70 Series like, True-RMS, more measurement functions, conformance to the latest safety standards, and a much larger display that's easier to view.

Features

| | True-RMS measurements | | |
|--|-----------------------|-------------|-------------|
| | 175 | 177 | 179 |
| Digital display counts, updates 4 times per second | 6000 | 6000 | 6000 |
| Display backlight | • | • | • |
| Analog bargraph / segments, updates 40 times per second | 33-segments | 33-segments | 33-segments |
| Auto and Manual ranging | • | • | • |
| Display Hold and AutoHOLD [®] | • | • | • |
| Min-Max-Average recording mode with Min/Max Alert | • | • | • |
| Temperature readings (lead thermocouple probe included) | • | • | • |
| Smoothing mode allows filtering of rapidly changing inputs | • | • | • |
| Audible continuity and diode test | • | • | • |
| Test lead alert | • | • | • |
| Unsafe voltage alert warns for voltages above 30V | • | • | • |
| Low battery indication | • | • | • |
| Ergonomic case with integrated holster | • | • | • |
| Easy battery and fuse exchange without opening the complete case | • | • | • |
| Selectable sleep mode preserves battery life | • | • | • |

Specifications

(Check the Fluke web for detailed specifications)

| Functions | Maximum | Max. resolution |
|-------------|--------------|-----------------|
| Voltage DC | 1000V | 0.1mV |
| Voltage AC | 1000V | 0.1mV |
| Current DC | 10A | 0.01mA |
| Current AC | 10A | 0.01mA |
| Resistance | 50M Ω | 0.1 Ω |
| Capacitance | 10000pF | 1nF |
| Frequency | 100kHz | 0.01Hz |
| Temperature | -40°C/+400°C | 0.1°C |

Accuracy are best accuracies for each function

| | | |
|-----------------|-----------------|-----------------|
| 175 | 177 | 179 |
| $\pm(0.15\%+2)$ | $\pm(0.09\%+2)$ | $\pm(0.09\%+2)$ |
| $\pm(1.0\%+3)$ | $\pm(1.0\%+3)$ | $\pm(1.0\%+3)$ |
| $\pm(1.0\%+3)$ | $\pm(1.0\%+3)$ | $\pm(1.0\%+3)$ |
| $\pm(1.5\%+3)$ | $\pm(1.5\%+3)$ | $\pm(1.5\%+3)$ |
| $\pm(0.9\%+1)$ | $\pm(0.9\%+1)$ | $\pm(0.9\%+1)$ |
| $\pm(1.2\%+2)$ | $\pm(1.2\%+2)$ | $\pm(1.2\%+2)$ |
| $\pm(0.1\%+1)$ | $\pm(0.1\%+1)$ | $\pm(0.1\%+1)$ |

Battery Life: Alkaline, 200 hrs typical
Size (HxWxD): 190 mm x 85 mm x 45 mm
Weight: 0.42 kg
Lifetime Warranty

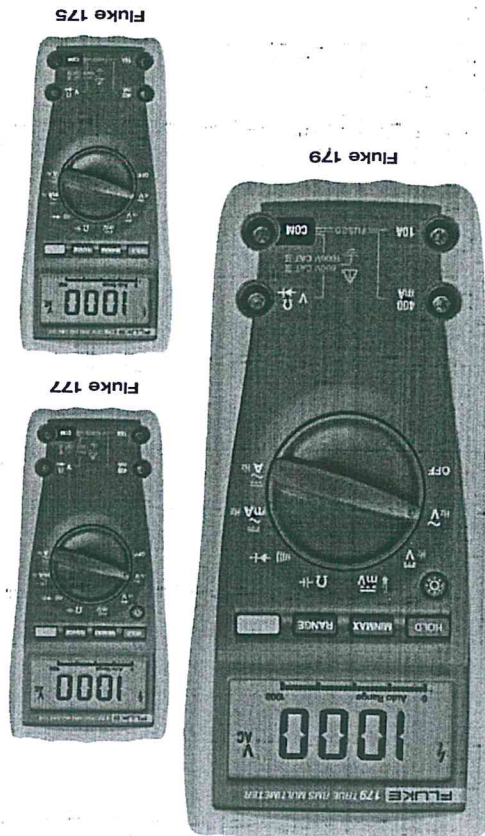
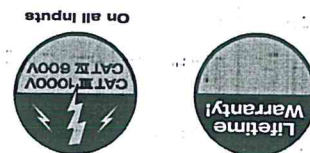
Recommended Accessories



Included Accessories
Test leads with 4 mm lantern tips and protective cap, installed 9V battery and users manual. The 179 also includes the 80BK temperature probe.

Ordering Information
Fluke 175 True RMS Multimeter
Fluke 177 True RMS Multimeter
Fluke 179 True RMS Multimeter
Fluke 179/EDA2 Kit Electronics Combo Kit
Fluke 179/MAG2 Kit Industrial Combo Kit

10342-eng Rev. 08



DATASHEET

1.31

CABLE



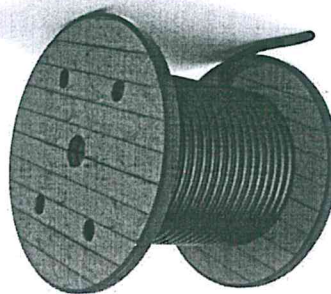
CABLE XLPE/PVC TYPE

BAC Corrosion Control Ltd supply a wide range of cables for Cathodic Protection systems.

We can advise you on the correct cable to use for your application and can cater for minimum order quantities, custom markings and insulation colour as required.

Our standard range of XLPE/PVC Cables are detailed as follows :

Quantity :
25,250m of 16mm² XLPE/PVC, Black
50,500m of 50mm² XLPE/PVC, Black



| Conductor Size mm ² | Number of Strands | Nom O.D. (mm) | Approx Nett Weight (kg/km) |
|--------------------------------|-------------------|---------------|----------------------------|
| 6 | 7 | 6.7 | 99 |
| 10 | 7 | 8.0 | 155 |
| 16 | 7 | 9.1 | 225 |
| 25 | 7 | 11.2 | 340 |
| 35 | 19 | 12.4 | 445 |
| 50 | 19 | 14.7 | 595 |
| 70 | 19 | 16.5 | 810 |
| 95 | 19 | 19.0 | 1110 |
| 120 | 37 | 20.6 | 1340 |

• **Insulation:** XLPE (Cross Linked Polyethylene) - Cross-linked polyethylene is a compound form of PE, which enhances the mechanical stability

• **Sheath:** PVC - is available in many compound forms but those used in cable manufacture are plasticized to allow extrusion techniques and subsequent flexibility. It has good ageing and mechanical properties. Can be supplied in Black or Red as standard.

• **Conductor:** Stranded or Solid Plain Annealed Copper.

• **Application:** Designed for use in cathodic protection systems. These cables are provided with PVC sheath for protection and are therefore suitable for external use and direct burial.

• **Technical Data:** Voltage: 600/1000V,

• **Temperature Range:** 20°C to +70°C

• **Relevant Standards:** Conductor: To BS6360 up to 35 mm²
To BS6346 above 50 mm²

• **Sizes and Dimensions**

All sizes and dimensions are approximate and for information only. BAC will confirm actual dimensions at time of order

if required:

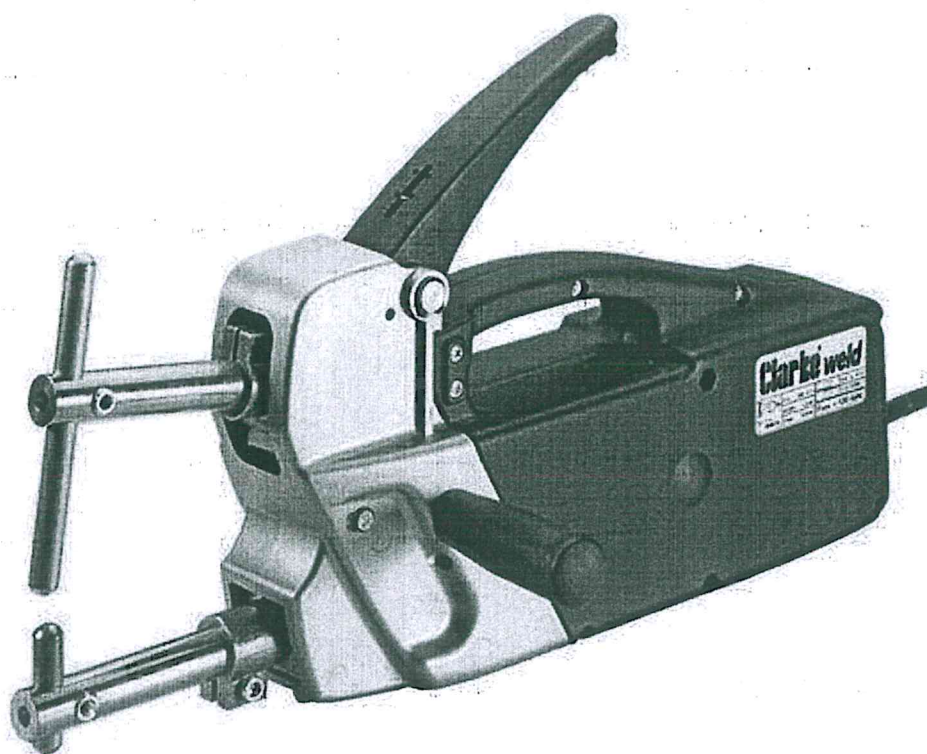
CORROSION CONTROL
BAC
BAC Corrosion Control Ltd
Stafford Park 11 • Telford • TF3 3AY
United Kingdom
T: +44 (0) 1952 290 321
E: sales@bacgroup.com
W: www.bacgroup.com

MIXED METAL OXIDE ANODES RIBBON TYPE SPOT WELDER

A portable spot welding kit that allows quick and easy connections between the MMO/Ti Ribbon Anode and Titanium Conductor Bar.

DATASHEET 1.11

SPOT WELDER



Quantity : 65 No

| TECHNICAL SPECIFICATIONS | |
|-----------------------------|----------------|
| Max. Welding Thickness (mm) | 1+1 |
| Input Voltage | 230 V |
| Dimensions | 440x110x185 mm |
| Rated Power | 1.2 kW |
| Max. Absorbed Power | 6 kW |





Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.03- Motor Datasheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

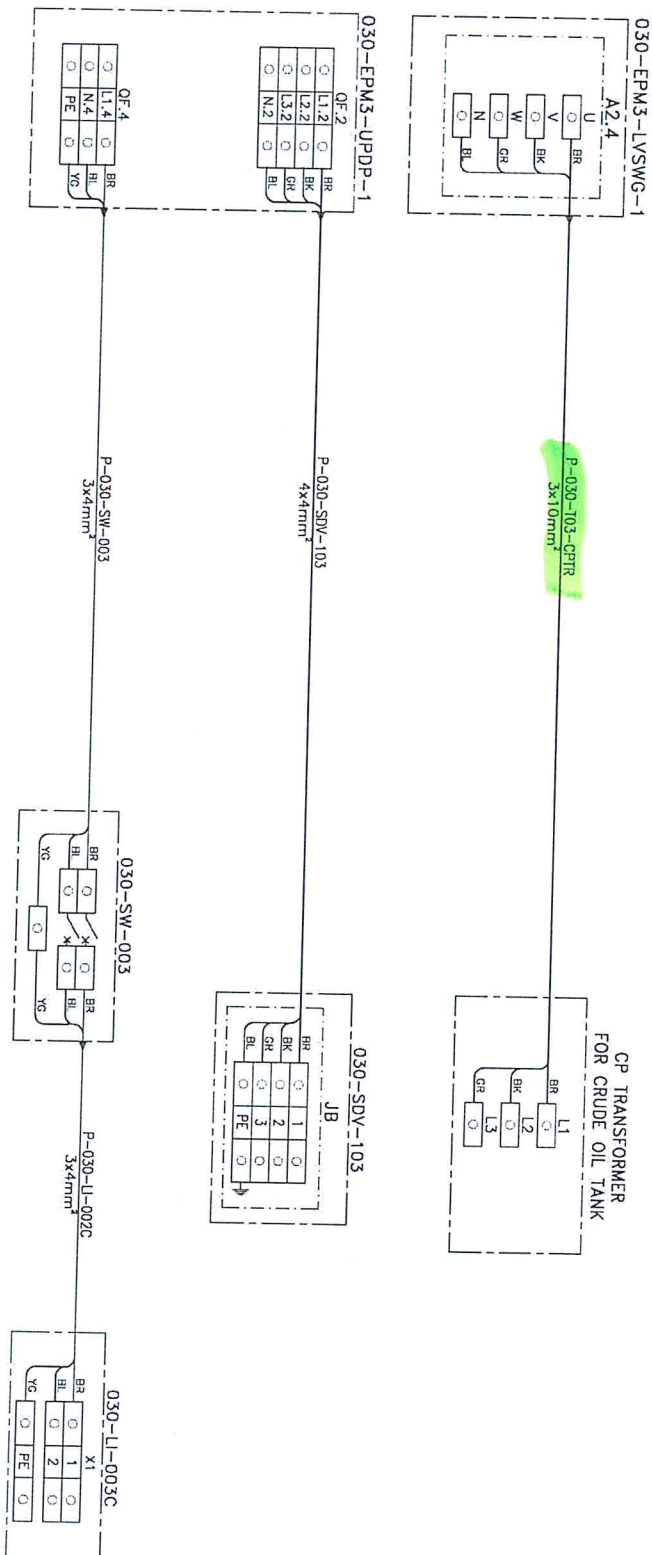
12.04- Electrical Cables Schedule

| GE-A1-L | Cable Mark | GL1 | FROM | TO | GL2 | CABLEService | Service Voltage | KW | Size | Type | L |
|---------|----------------|-----|-------------------------|-------------------------------|-----|------------------|-----------------|----|------|------|-----|
| 56 | P-030-T03-CPTR | WP | 030-EPM3-LVSWG-1 (A2.4) | CP Transformer for Crude Tank | WP | 3PH POWER FEEDER | 400VAC | 15 | 3x35 | 3C | 300 |

ELECTRICAL POWER MODULE

MCC ROOM

FIELD



NOTES:
1. THE DRAWING IS THE PROPERTY OF EGPCC. IT IS TO BE USED FOR THE PROJECT ONLY AND NOT TO BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF EGPCC.
2. THE DRAWING IS THE PROPERTY OF EGPCC. IT IS TO BE USED FOR THE PROJECT ONLY AND NOT TO BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF EGPCC.
3. THE DRAWING IS THE PROPERTY OF EGPCC. IT IS TO BE USED FOR THE PROJECT ONLY AND NOT TO BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF EGPCC.

EGPC
THE EGYPTIAN GENERAL PETROLEUM CO.
EGPC

THE EGYPTIAN GENERAL PETROLEUM CORPORATION (EGPC)
EGPC

AT : ASHROOD
EGPC CRUDE OIL TANK FARM
ASROOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
TANK-3 AUXILIARIES
(030-I-03)

الشركة المصرية العامة للبترول والكيماويات
النفطية
النفطية العامة للبترول والكيماويات
النفطية العامة للبترول والكيماويات

EGPC CRUDE OIL TANK FARM
ASROOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
TANK-3 AUXILIARIES
(030-I-03)

EGPC CRUDE OIL TANK FARM
ASROOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
TANK-3 AUXILIARIES
(030-I-03)

EGPC CRUDE OIL TANK FARM
ASROOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
TANK-3 AUXILIARIES
(030-I-03)

EGPC CRUDE OIL TANK FARM
ASROOD AREA (MODULE-1)
ELECTRICAL INTERCONNECTION & WIRING DIAGRAM
TANK-3 AUXILIARIES
(030-I-03)



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.05- Electrical Cables Laying Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.06- Electrical Cables Testing Certificates



EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR
CABLE INSULATION RESISTANCE TEST

INSPECTION REPORT NUMBER
REF-177

INSTRUMENT TYPE:

INSPECTION DATE & TIME

DOCUMENT No.
ITR-EL-0006A

SYSTEM NO.:

SHEET NO

DISCIPLINE
ELECTRICAL

SERVICE VOLTAGE:
220 V

TEST VOLTAGE:
1kv

AREA / PACKAGE:

SERIAL:

| N O | Item/Tag NO. | CABLE SIZE | Continuity Test | PHASE TO PHASE "M.Ohm" | | | PHASE TO NUETRAL "M.Ohm" | | | PHASES & NUETRAL TO ARMOR "M.Ohm" | | | | RESULT | |
|--------|---------------------------|-----------------|--------------------|------------------------|-------|-------|-----------------------------|------|------|--------------------------------------|--------|--------|-------|--------------|------|
| | | | | BR-BK | BR-GR | BK-GR | BR-B | BK-B | GR-B | BR-ARM | BK-ARM | GR-ARM | B-ARM | Pass | FAIL |
| 1 | P-AG030-TR-004 | 3x10 | ✓ | | | | OK | | | | | | | ✓ | |
| 2 | P-AG030-TR-005 | 3x10 | ✓ | | | | OK | | | | | | | ✓ | |
| 3 | P-030-103-CPTR | 3x10 | ✓ | | | | OK | | | | | | | ✓ | |
| 4 | P-030-104-CPTR | 3x10 | ✓ | | | | OK | | | | | | | ✓ | |
| 5 | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | |

Remarks :-

Reference :-

| | | | |
|-----------|----------|-----|-----|
| | PETROJET | ENR | PMC |
| NAME : | | | |
| SIGNATURE | | | |
| DATE | | | |



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.07- Electrical Cables Termination Certificates



EGPC CRUDE OIL TANK FARM
AGROOD AREA (MODULE 1 &2)



Owner: **Egyptian General Petroleum Corporation (EGPC)**

Project No: 01251-100-030
:01251-100-031

| | |
|------------|-------------------------------|
| Contractor | CONSORTIUM (ENPPI / PETROJET) |
|------------|-------------------------------|

Document No: ITR-QC-0001
Revision No.: 00

REQUEST FOR INSPECTION

ACTIVITY: PERMANENT REFERENCE ELECTRODE & MONITORING PIPE




NOTIFICATION NO. : PTJ-ELE-RFI-007 DISCIPLINE: CATHODIC PROTECTION

DATE: _____ 20-5-2020

[illegible]

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

| PETROJET | | ENPPI | |
|--|---|---|--|
| NAME: Mustafa Ibrahim Islam Gaballah | | NAME: A. El Beroud | |
| SIGNATURE:  |  | SIGNATURE:  | |
| DATE: 20.5.2020 | 20/5/20 | DATE: | |

ITR-QC-0001



EGPC CRUDE OIL TANK FARM AGROOD
AREA (MODULE 1 & 2)



PETROJET
The Petroleum Projects and
Technical Consultations Co.
One of the Egyptian General Petroleum
Corporation Companies

INSPECTION AND TEST REPORT FOR

PERMANENT REFERENCE ELECTRODE & MONITORING PIPE

| | | | | |
|--------------------------|------------------------|-----------------------------|--------------------------|--------------------|
| INSPECTION REPORT NUMBER | INSPECTION DATE & TIME | DOCUMENT No. ITR-CP-0002 | DISCIPLINE ELECTRICAL | SHEET NO 1 OF 1 |
|--------------------------|------------------------|-----------------------------|--------------------------|--------------------|

| | | |
|---|---|-----------------------------------|
| JOB DESCRIPTION CATHODIC PROTECTION SYSTEM | AREA DESCRIPTION 030-T-01 | |
| ITEM / TAG NO. 030-T-04-CP | DRAWING NO. 1251-100-116-02-XX-D99-023 | LOCATION AGROUD AREA MODULE 01 |

| NO. | INSPECTION | RESULT | | |
|-----|---|--------|--------|------|
| | | ACCEPT | REJECT | N/A. |
| 1 | RE visually inspected for damage and tested prior to installation | ✓ | | |
| 2 | Location of reference electrode correct | ✓ | | |
| 3 | Location of monitoring tube correct | ✓ | | |
| 4 | Reference electrode calibration test – measure potential to a calibrated portable CSE RE immersed in fresh water along with the permanent RE to be tested. Potential difference shall be within $\pm 20\text{mV}$ | ✓ | | |
| 5 | Elevation of reference electrode (m) as relevant drawing | ✓ | | |
| 6 | Monitoring tube installed straight and free from inside obstructions | ✓ | | |
| 7 | Reference electrode quantity as relevant drawing | ✓ | | |
| 8 | Reference electrode spacing | ✓ | | |
| 9 | Carefully selected backfill installed around anode which is free from rocks, boulders and metallic debris | ✓ | | |
| 10 | Structure-to-electrolyte potential recorded with the permanent reference electrode | | | ✓ |
| 11 | Cables have no physical damage with sufficient slack cable to permit removal of terminated cables from terminals | ✓ | | |
| 12 | Reinstatement completed and waste materials removed from site | ✓ | | |

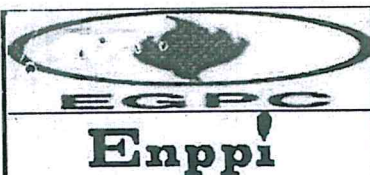
REMARKS:

| PETROJECT | | ENPPI | |
|-----------|------------------------|-----------|--------------------|
| NAME: | <i>Mostafa Ibrahim</i> | NAME: | <i>A. ElBarady</i> |
| SIGNATURE | <i>[Signature]</i> | SIGNATURE | <i>[Signature]</i> |
| DATE | <i>20.5.2020</i> | DATE | <i>20/5/20</i> |

ITR-CP-0002



ITR-QC-0001



EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR

MMO RIBBON & CONDUCTOR BAR.

| | | | | |
|---|---|-------------------------------------|--------------------------|--------------------|
| INSPECTION REPORT NUMBER PTJ-ELE-RFI-002 | INSPECTION DATE & TIME | DOCUMENT No. ITR-CP-0001 | DISCIPLINE ELECTRICAL | SHEET NO 1 OF 1 |
| JOB DESCRIPTION EXTERNAL CATHODIC PROTECTION SYSTEM FOR CRUDE OIL TANK | | AREA DESCRIPTION 030-T-01 | | |
| ITEM / TAG NO. 030-T-04-CP | DRAWING NO. 1251-100-116-02-XX-D99-022 | LOCATION AGROUD AREA - MODULE 01 | | |

| NO. | INSPECTION | RESULT | | |
|-----|---|--------|--------|------|
| | | ACCEPT | REJECT | N/A. |
| 1 | Anode installation area free from metallic debris prior to installation and level | ✓ | | |
| 2 | Anode visually inspected for damage prior to installation | ✓ | | |
| 3 | MMO Ribbon installed as relevant drawing | ✓ | | |
| 4 | Conductor Bar installed as relevant drawing | ✓ | | |
| 5 | Continuity test shall be conducted between Conductor bar and MMO anode prior to backfilling | ✓ | | |
| 6 | All spot welding at crossing locations visually inspected and checked | ✓ | | |
| 7 | Power feed connectors installed at correct locations as relevant drawing | ✓ | | |
| 8 | Power feed cables have no physical damage with sufficient slack cable to permit exit from ring beam and termination in junction box | ✓ | | |
| 9 | Continuity test shall be conducted for all Power feed cables before and after backfilling. | ✓ | | |
| 10 | No Interference or contact with the tank external surfaces | ✓ | | |
| 11 | Cable routing | ✓ | | |
| 12 | Carefully backfill sand over anode to required depth under the tank which is free from rocks, boulders and metallic debris | ✓ | | |
| 13 | Output current measurement at power feed cables | | | ✓ |
| 14 | Waste materials removed from site | ✓ | | |

REMARKS:

| | | | |
|-----------|-------------|-----------|--------------|
| PETROJET | | ENPPI | |
| NAME: | Hussein Ali | NAME | Ayman Bakeir |
| SIGNATURE | | SIGNATURE | |
| DATE | 4/5/2020 | DATE | 04-05-2020 |

ITR-CP-0001

**Enppi**

EGPC CRUDE OIL TANK FARM



Owner : Egyptian General Petroleum Corporation (EGPC)

Project No: 01251-100-030
:01251-100-031

Contractor CONSORTIUM (ENPPI / PETROJET)

Document No: ITR-QC-0001
Revision No. : 00**REQUEST FOR INSPECTION**

ACTIVITY : cable termination and splicing

NOTIFICATION NO. : PTJ-ELEC-RFI-179 DISCIPLINE : E&I

DATE : 4/26/2021

| NO. | DESCRIPTION | LOCATION | DATE / TIME | INSPECTION | | | REMARKS |
|-----|-----------------------|----------|-------------|------------|-------|-----|---------|
| | | | | PETROJET | ENPPI | PMC | |
| | cable termination | MODULE 1 | 26-Apr-21 | | | | |
| 1 | P-AG030-TR-004 | | | | | | |
| 2 | P-AG030-TR-005 | | | | | | |
| 3 | P-030-T03-CPTR | | | | | | |
| 4 | XXXXXXXXXX | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |

NOTE: 1- plugs to be installed in transformer side (Done) Seb
2- S.S tag for the cables to be installed (Done) Seb

Inspection result : A - Approved B - Reject C - Approved with Comment

| | PETROJET | ENPPI | PMC |
|-----------|----------|--------|-----|
| NAME | | Sherif | |
| SIGNATURE | | | |
| DATE | | | |

ITR-QC-0001



EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR

CABLE TERMINATION AND SPLICING

SYSTEM NO.:

INSPECTION REPORT NUMBER

INSPECTION DATE & TIME

ITR NUMBER

DISCIPLINE

SHEET NO

PTJ-ELE-RFI-179

ITR-EL-0009

ELEC

1 OF 1

Item/Tag NO.

Type :-

Core:

Size:

| NO. | Description of check | RESULT | | |
|-----|---|--------|--------|------|
| | | ACCEPT | REJECT | N/A. |
| 1 | Check cable glands are correct type and size as per cable schedule. | ✓ | | |
| 2 | Check there are no damages to cores, termination chamber layout is satisfactory, core identification is correct, crimped and pins satisfactory. | ✓ | | |
| 3 | Check cable tag is done correctly. | ✓ | | |
| 4 | Test and confirm conductor, phase continuity. | ✓ | | |
| 5 | Check insulation resistance test (megger) is completed *I | ✓ | | |
| 6 | Check Hi-pot test is completed, only for MV/HV cables *II | | | ✓ |
| 7 | Connect all cores at both ends and confirm all connections are correct as per termination diagram. | ✓ | | |
| 8 | Confirm spare cores, screens are earthed and conform to design drawings/specifications | | | ✓ |
| 9 | Check enclosure cover is installed, no damages and no bolts are missing | ✓ | | |
| 10 | Calibration test certificate of testing equipment to be checked. | ✓ | | |

Remarks :

| | PETROJET | ENPPI | PMC |
|-----------|----------|-------|-----|
| NAME : | | | |
| SIGNATURE | | | |
| DATE | | | |

ITR-EL-0009

| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.08- FAT Reports & Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.09- SAT Reports & Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.10- Electrical Pre-Commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

12.11- Electrical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

13- Electrical Commissioning



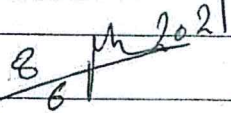
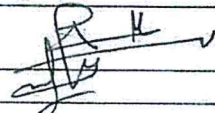
Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

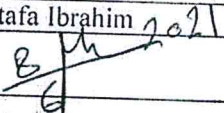
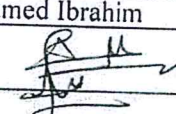
13.01- Electrical -Commissioning Check Lists

| | | |
|---|---------------------|-------------|
| PROJECT | EGPC STORAGE TANKS | |
| LOCATION | AGROOD | |
| CLIENT | PMC | |
| SUPPLIER | PETROJET | |
| MANUFACTURE | BAC | |
| TANK SERVICE | TANK 30-TK-03 | |
| Pre-Commissioning Check Sheet for Transformer Rectifier Unit | | |
| CHECK LIST | TEST / CHECK REPORT | |
| Transformer Rectifier Unit / Location | OUTSIDE BUND WALL | |
| Rectifier Manufacturer | BAC | |
| Rectifier Type / Serial Number | OIL COOLD | |
| Rectifier Rating | AC Input | 3 PHASE |
| | DC Output | 50 A /150 A |
| All Cables (AC / DC) are properly terminated identified with proper tagging | | OK |
| Transformer Rectifier is properly grounded to the earthing system. | | OK |
| Oil Gauge, Silica Gel Breather & Fuse are properly fixed and secured without any damages. | | OK |
| T/R Unit is filled with suitable type of cooling oil at the required level. | | OK |
| Confirm TRU enclosure is earthed properly | | OK |
| Remarks | | |

| | | |
|-----------|---|---|
| | COMPLETED BY | WITNESSED BY |
| Company | PETROJET | PMC |
| Name | Eng. Mostafa Ibrahim | Eng. Mohamed Ibrahim |
| Signature |  |  |
| Date | 8/ 6/ 2021 | |

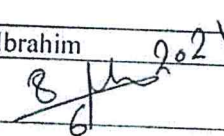
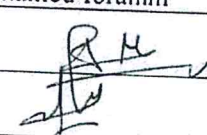
Cathodic Protection Commissioning Report

| | | | |
|---|--|---------------------|--|
| PROJECT | EGPC STORAGE TANKS | | |
| LOCATION | AGROOD | | |
| CLIENT | PMC | | |
| SUPPLIER | PETROJET | | |
| MANUFACTURE | BAC . | | |
| TANK SERVICE | TANK 30-TK-03 | | |
| Pre-Commissioning Check Sheet For Junction Boxes (Anode Junction Boxes) | | | |
| CHECK LIST | | TEST / CHECK REPORT | |
| Confirm Location | | Outside Bund Wall | |
| Physical Condition (Internally & Externally) | | OK | |
| Number of Circuits | | 17 | |
| Junction box is properly mounted and secured on the frame | | OK | |
| All cables are properly terminated inside the junction box unit | | OK | |
| Remarks | 17 circuits divided into 2 anode junction boxes: - - 10 and 7 | | |

| | | |
|-----------|---|---|
| | COMPLETED BY | WITNESSED BY |
| Company | PETROJET | PMC |
| Name | Eng. Mostafa Ibrahim | Eng. Mohamed Ibrahim |
| Signature |  |  |
| Date | 8/ 6/ 2021 | |

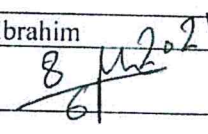
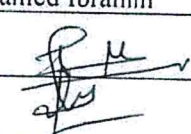
Cathodic Protection Commissioning Report

| | | | |
|--|--|---------------------|--|
| PROJECT | EGPC STORAGE TANKS | | |
| LOCATION | AGROOD | | |
| CLIENT | PMC | | |
| SUPPLIER | PETROJET | | |
| MANUFACTURE | BAC | | |
| TANK SERVICE | TANK 30-TK-03 | | |
| Pre-Commissioning Check Sheet for Test Posts (Galvanized Steel Type) | | | |
| CHECK LIST | | TEST / CHECK REPORT | |
| Test Post Location | | Outside Bund Wall | |
| Number of Cables Terminated | | 23 | |
| Physical Condition (Internally & Externally) | | OK | |
| Test Post is properly mounted and secured on the test post conduit. | | OK | |
| All cables are properly terminated inside the big fink. | | OK | |
| Remarks | 23 circuits divided into 5 test points 4 TP.1 - 5 TP.2 - 5 TP.3 - 5 TP.4 - 4 TP.5 | | |

| | | |
|-----------|---|---|
| | COMPLETED BY | WITNESSED BY |
| Company | PETROJET | PMC |
| Name | Eng. Mostafa Ibrahim | Eng. Mohamed Ibrahim |
| Signature |  |  |
| Date | 8/ 6/ 2021 | |

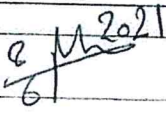

Cathodic Protection Commissioning Report

| | | | |
|---|--------------------|--------------------|------------------------|
| PROJECT | EGPC STORAGE TANKS | | |
| LOCATION | AGROOD | | |
| CLIENT | PMC | | |
| SUPPLIER | PETROJET | | |
| MANUFACTURE | BAC . | | |
| TANK SERVICE | TANK 30-TK-03 | | |
| Commissioning Check Sheet for Transformer Rectifier Unit | | | |
| Location : Agrood | | Parameter Settings | |
| | | Rated AC Input | 400(V) /50 Hz |
| | | Rated DC Output | 50 (V) 150 (A) |
| Control Parameters | | Adjusted | |
| DC Output Voltage | | 2.3 (V) | |
| DC Output Current | | 1.3 (mA) | |
| Overall Circuit Resistance | | 1.7 KOHM | |
| REMARKS: | | | |

| | | |
|------------------|---|---|
| | COMPLETED BY | WITNESSED BY |
| Company | PETROJET | PMC |
| Name | Eng. Mostafa Ibrahim | Eng. Mohamed Ibrahim |
| Signature |  |  |
| Date | 8/6/2021 | |

Cathodic Protection Commissioning Report

| PROJECT | EGPC STORAGE TANKS | | | |
|---|--------------------|-------------------|--------------------------------|---------|
| OWNER | AGROOD | | | |
| SUPPLIER | PETROJET | | | |
| MANUFACTURE | BAC | | | |
| TANK SERVICE | TANK 30-TK-03 | | | |
| Commissioning Check Sheet For Structure-To-Soil Potential Measurement (Test Post Location) | | | | |
| Test Post location | | | | |
| TEST NO. | TEST FACILITY | | POTENTIAL | REMARKS |
| | TYPE | Location | ON - POTENTIAL V | |
| 1 | GALVANIZED STEEL | OUTSIDE BUND WALL | - 1 / -1.2 / -1.1 / -0.9 | Accept |
| 2 | GALVANIZED STEEL | OUTSIDE BUND WALL | -1 / -1.2 / -1.2 / -1.2 / -1.2 | Accept |
| 3 | GALVANIZED STEEL | OUTSIDE BUND WALL | -1.2 / -1 / -1.3 / -1.2 / -1.2 | Accept |
| 4 | GALVANIZED STEEL | OUTSIDE BUND WALL | -1 / -1.2 / -1.1 / -1.2 / -1 | Accept |
| 5 | GALVANIZED STEEL | OUTSIDE BUND WALL | -0.9 / -1.1 / -1.2 / -0.85 | Accept |
| Reference Electrode (Type): CU/CUSO4 | | | | |
| General Notes: | | | | |

| | COMPLETED BY | WITNESSED BY |
|------------------|---|---|
| Company | PETROJET | PMC |
| Name | Eng. Mostafa Ibrahim | Eng. Mohamed Ibrahim |
| Signature |  |  |
| Date | 8/6/2021 | |



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

13.02- Electrical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

14- Red Marked-up Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

14.01- P&ID

| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

14.02- Instrumentation Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



| | |
|--------------------|------------------------------------|
| System ID | 030-CP-004 |
| System Description | Tank-03 Cathodic Protection System |

14.03- Electrical Drawings